User's Manual

DAQSTATION DX100P/DX200P
Communication Interface

* 4 L 5 A 1 1 7 E 0 4 *

YOKOGAWA
Yokogawa Electric Corporation

IM 04L05A01-17E
4th Edition

Forward

Thank you for purchasing the YOKOGAWA DAQSTATION DX100P/DX200P (hereinafter "the DXP").
This Communication Interface User's Manual contains information about the communication functions such as the Ethernet/serial interface. To ensure correct use, please read this manual thoroughly before operation.
Keep this manual in a safe place for quick reference in the event a question arises.
The following five manuals, including this one, are provided as manuals for the DX100P/DX200P.

Manual Name	Manual No.	Description
DX100P User's Manual	IM 04L05A01-01E	Explains all functions and procedures of the DX100P excluding the communication functions.
DX200P User's Manual	IM 04L06A01-01E	Explains all functions and procedures of the DX200P excluding the communication functions.
DX100P/DX200P Operation Guide	IM 04L05A01-02E	Briefly explains the basic operations of the DXP.
DX100P/DX200P Communication Interface User's Manual	IM 04L05A01-17E	This manual. Explains the communication functions of the Ethernet/serial interface.
DAQSIGNIN User's Manual	IM 04L05A01-61E	Describes the functions and operating procedures of DAQSIGNIN.

Notes

- This manual describes the communication functions of the DX100P/DX200P with the style number "S5."
- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the instrument's performance and functions. The figures given in this manual may differ from the actual screen.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact your nearest YOKOGAWA dealer.
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How to Use this Manual

Structure of the Manual

The structure of this User's Manual is as follows.

Chapter 1 Overview of the Communication Functions
Describes the relationship between the communication functions and the interface and provides an outline of the communication functions.

Chapter 2 Using the Ethernet Interface
Describes the specifications and setup procedures of the Ethernet interface. Also describes how to use the setting/measurement server, FTP client, FTP server, Web server, e-mail transmission function, maintenance/test server, and instrument information server.

Chapter 3 Using the Serial Interface (/C2, /C3 Options)
Describes the specifications and setup procedures of the serial interface (option). Also describes how to use the setting/measurement function and the barcode input function.

Chapter 4 Using the Modbus (/C2, /C3 Options)
Describes the specifications and setup procedures of the Modbus protocol. Also describes how to use the Modbus STATUS screen.

Chapter 5 Commands
Describes each command that can be used.

Chapter 6 Response
Describes the data format of the measured/computed data and files that are output from this instrument.

Chapter 7 Status Report
Describes the status information.

Appendix
Provides an ASCII character code table, the flow of operation when outputting data from the DXP, a list of error messages, and the login process.

Index
Provides an index.

Conventions Used in this Manual

Unit

- k Denotes 1000. Example: 5 kg, 100 kHz
- K Denotes 1024. Example: 720 KB

Symbols

The following symbols are used in this manual.

Improper handling or use can lead to injury to the user or damage to the instrument. This symbol appears on the instrument to indicate that the user must refer to the user's manual for special instructions. The same symbol appears in the corresponding place in the user's manual to identify those instructions. In the manual, the symbol is used in conjunction with the word "WARNING" or "CAUTION."

WARNING Describes precautions that should be observed to prevent injury or death to the user.

CAUTION Describes precautions that should be observed to prevent minor or moderate injury, or damage to the instrument.

Note Provides important information for the proper operation of the instrument.

Displayed characters

Alphanumeric characters enclosed with [ ] refer to characters or setting values that are displayed on the screen.

Symbols used on pages describing operating procedures

On pages that describe the operating procedures in Chapter 2 through 4, the following symbols are used to distinguish the procedures from their explanations.

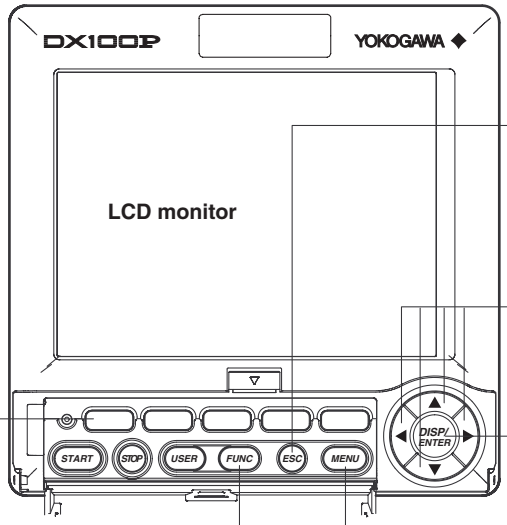
Explanation This section describes the setting parameters and the limitations regarding the procedures.

Procedure Follow the steps indicated with numbers. The procedures are given with the premise that the user is carrying out the steps for the first time. Depending on the operation, not all steps need to be taken.

Names and Uses of Parts

Front Panel

DX100P



ESC key
Press this key to return to the previous screen or cancel the new settings.

Arrow keys
Press these keys to move between the setup items displayed on the screen.

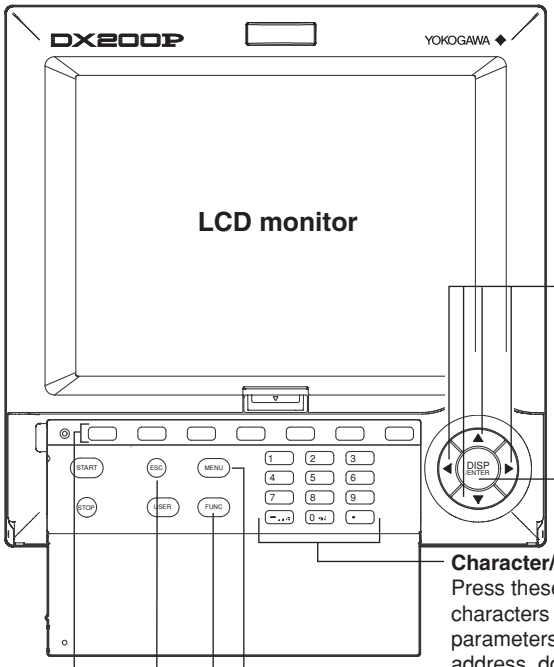
DISP/ENTER key
Press this key when confirming the setting or when closing the entry box.

Soft keys
Press these keys to select the menu displayed on the screen.

MENU key
Press the MENU key to enter the engineering mode.

FUNC key
Press the FUNC key to display the FUNC key menu, such as FTP test, e-mail transmission test, and log display.

DX200P



Arrow keys
Press these keys to move between the setup items displayed on the screen.

DISP/ENTER key
Press this key when confirming the setting or when closing the entry box.

Character/number input key
Press these keys to enter characters or numbers for parameters such as the IP address, domain name, and server name.

MENU key
Press the MENU key to enter the engineering mode.

FUNC key
Press the FUNC key to display the FUNC key menu, such as FTP test, e-mail transmission test, and log display.

ESC key
Press this key to return to the previous screen or cancel the new settings.

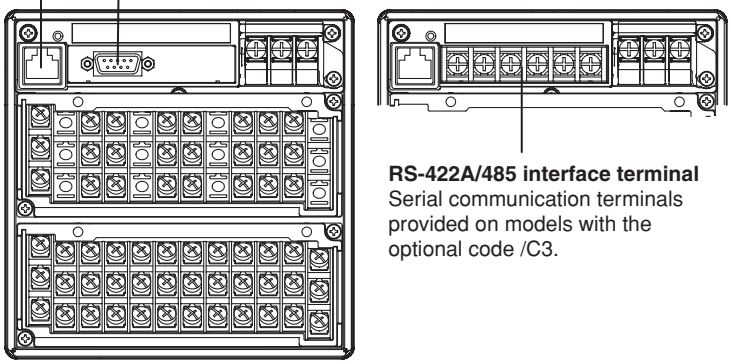
Soft keys
Press these keys to select the menu displayed on the screen.

Rear Panel

DX100P

Ethernet interface connector
A connector used for Ethernet communications. Comes standard with the instrument.

RS-232 interface connector
A serial communication connector provided on models with the optional code /C2.

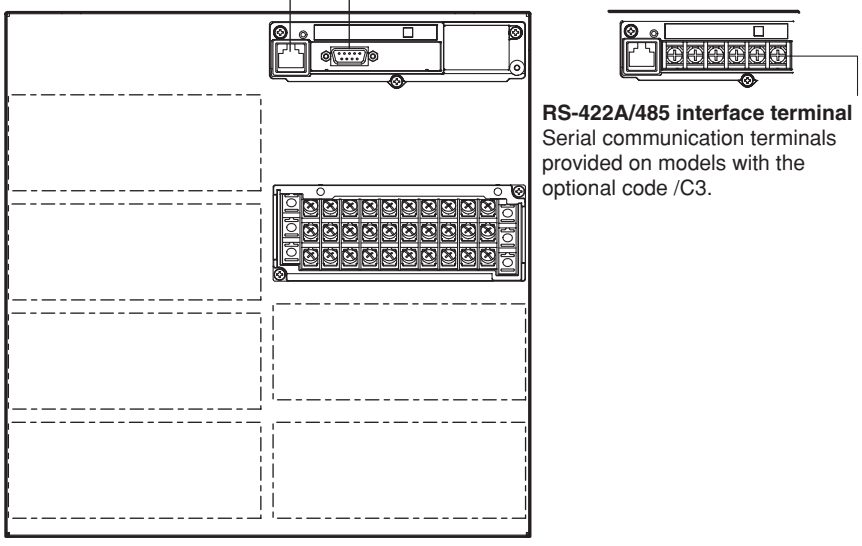


RS-422A/485 interface terminal
Serial communication terminals provided on models with the optional code /C3.

DX200P

Ethernet interface connector
A connector used for Ethernet communications. Comes standard with the instrument.

RS-232 interface connector
A serial communication connector provided on models with the optional code /C2.



RS-422A/485 interface terminal
Serial communication terminals provided on models with the optional code /C3.

Flow of Operation using the Operation Keys

This section will describe the basic flow of operation when changing the settings of the DXP using the front panel keys.

Entering the System Mode

Note

- Settings related to communications are configured in the system mode.
- You can enter the system mode only if you log in as a registered administrator.

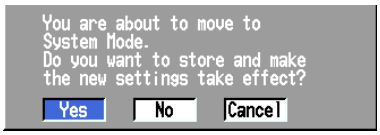
1. Press the MENU key to display the engineering mode menu.

Note

You cannot enter the engineering mode when Memory Start is in progress*, when the sign record screen is displayed, when saving data to an external storage medium, or when there is data that has not been saved to the external storage medium.

* "Memory Start in progress" is a condition in which measured/computed data is being acquired to the internal memory and the operation of automatically storing data to the external storage medium is in progress.

2. Press the soft key corresponding to [System Mode].
   A dialog box that asks you whether or not the new settings are to be stored.
3. Select [Yes] or [No] and press the DISP/ENTER key.
   The system mode menu appears.



Note

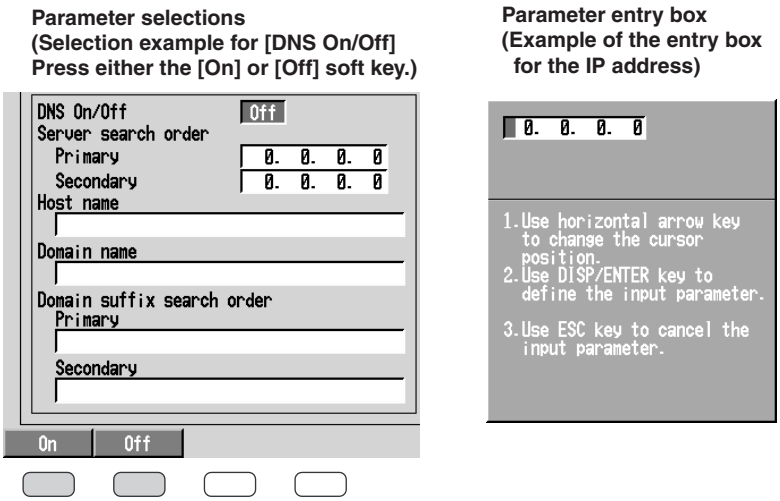
If an external storage medium is not inserted when you select [Yes], an error message "Media has not been inserted" appears. In this case, the settings cannot be saved, and the DXP cannot proceed to the system mode. The error message is cleared by pressing ESC. Insert an external storage medium into the drive and carry out the procedure again.

Changing the settings

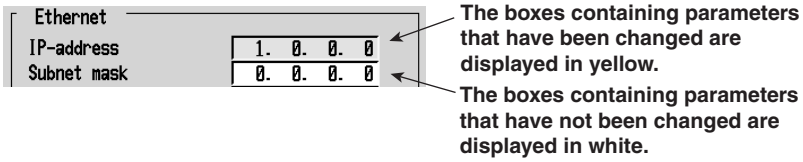
1. Press the soft key corresponding to the objective settings. This procedure is described in the procedure for each item.
2. Press the arrow keys to move the cursor onto the desired parameter.

The parameter box containing the cursor is blue.

3. For parameters whose selections are shown at the bottom of the screen, press the soft key under the desired selection.
   For parameters that need characters to be entered in the entry box, press the [Input] soft key to display the entry box, enter the characters, and press the DISP/ENTER key.



- The boxes containing parameters that have not been changed are displayed in white.
- The boxes containing parameters that have been changed are displayed in yellow.



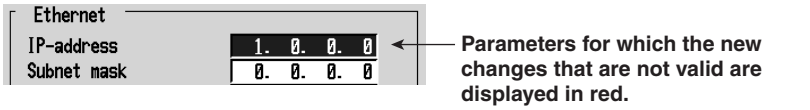
4. Set other parameters as well according to steps 2 and 3.

Confirming/Canceling the new changes

The operation is different when you are confirming or canceling the new changes (parameter boxes in yellow). See below.

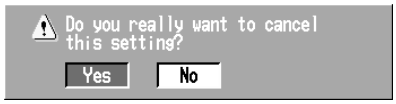
- **When confirming the new changes**

  Press the DISP/ENTER key. The new changes are confirmed and the yellow parameter boxes change to white. The cursor returns to the parameter at the upper left portion of the screen (the first parameter on the screen). However, if the new change is not valid, then the parameter box turns red.



- **When canceling the new changes**

  1. Press the ESC key.
     A window appears for you to confirm the cancellation.
  2. Selecting [YES] and pressing the DISP/ENTER key cancels the new settings and the screen returns to the previous screen.
     Selecting [No] and pressing the DISP/ENTER key does not cancel the new settings and the screen returns to the original screen.

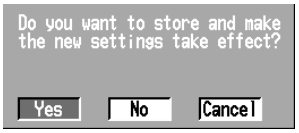


Storing the new settings

To activate the new settings in the system mode, the settings must be stored.

1. Pressing the [End] soft key in the system mode menu* displays a dialog box that asks you whether or not the new settings are to be stored.
2. To store the settings, select [Yes]. To not store the settings, select [No]. To return to the system mode menu, select [Cancel] by pressing the arrow key, and press the DISP/ENTER key.

   * The system mode menu is the menu that is displayed when the ESC key is pressed several times after the parameters are changed.



Note

If an external storage medium is not inserted when you select [Yes], an error message “Media has not been inserted” appears. In this case, the settings cannot be saved, and the DXP cannot proceed to the system mode. The error message is cleared by pressing ESC. Insert an external storage medium into the drive and carry out the procedure again.

Contents

Forward i
How to Use this Manual ii
Names and Uses of Parts iv

Chapter 1 Overview of the Communication Functions

1.1 Overview of the Communication Function Using the Ethernet Interface 1-1
Functional Structure 1-1
Connection to the Server Functions 1-1
Setting/Measurement Server 1-2
FTP Server 1-3
FTP Client 1-4
Web Server 1-5
E-mail Transmission 1-6
SNTP Server 1-7
SNTP Client 1-7
Maintenance/Test Server 1-8
Instrument Information Server 1-8
Other Functions 1-8
Overview of the Configuration 1-9
1.2 Overview of the Communication Function Using the Serial Interface 1-10
Functional Structure 1-10
Setting/Measurement Function 1-11
Modbus Slave 1-12
Modbus Master 1-12
Barcode Input 1-13
Displaying Error/Communication/FTP/Web operation/E-mail logs 1-13
Overview of the Configuration 1-13

Chapter 2 Using the Ethernet Interface

2.1 Ethernet Interface Specifications 2-1
2.2 Connecting the Ethernet Interface 2-2
2.3 Configuring the Ethernet Interface 2-3
2.4 Checking the Connection Status of the Ethernet Interface 2-9
2.5 Setting the FTP Client 2-10
2.6 Setting Timeout/Keep Alive and the User That Is to Use the Communication Input Data 2-16
2.7 Using the Setting/Measurement Server 2-19
2.8 Using the FTP Server 2-26
2.9 Using the FTP Client 2-29
2.10 Setting the Web Server Function 2-32
2.11 Using the Web Server 2-36
2.12 Setting the E-Mail Transmission Function 2-42
2.13 Using the E-Mail Transmission Function 2-51
2.14 Using the Maintenance/Test Server 2-54
2.15 Using the Instrument Information Server 2-57
2.16 Setting the SNTP Server Function or SNTP Client Function 2-59
2.17 Using the SNTP Server Function or SNTP Client Function 2-63

Chapter 3 Using the Serial Interface (/C2, /C3 Options)

3.1 Serial Interface Specifications 3-1
3.2 RS-232 Interface Connector Pin Arrangement and Signal Names, the Connection Procedure, and Handshaking 3-2
3.3 RS-422A/485 Interface Pin Arrangement, Signal Names, and the Connection Procedure 3-5
3.4 The Bit Structure of One Character and the Operation of the Receive Buffer 3-9
3.5 Configuring the Serial Interface 3-10
3.6 Using the Setting/Measurement Function 3-13
3.7 Using Barcode Input 3-15

Chapter 4 Using the Modbus (/C2, /C3 Options)

4.1 Modbus Protocol Specifications 4-1
4.2 Register Assignments 4-2
4.3 Modbus Error Response (Modbus Slave) 4-3
4.4 Setting the Configuration that is Used When the Modbus Protocol is Used 4-4
4.5 Setting the Modbus Master Function 4-7
4.6 Checking the Operating Status of the Modbus Master Function 4-13

Chapter 5 Commands

5.1 Command Syntax 5-1
5.2 A List of Commands 5-3
5.3 Input Range Parameter 5-8
5.4 Setting Commands (Engineering Mode) 5-10
5.5 Setting Commands (System Mode) 5-18
5.6 Control Commands 5-28
5.7 Output Commands 5-35
5.8 RS-422A/485 Dedicated Commands 5-38
5.9 Maintenance/Test Commands 5-38

Chapter 6 Response

6.1 Response Syntax (Measurement Server) 6-1
6.2 Output Format of ASCII Data 6-6
6.3 Output Format of BINARY Data 6-25

Chapter 7 Status Report

7.1 The Bit Structure of the Status Information 7-1
7.2 Status Information and Filter 7-3

Appendix

Appendix 1 ASCII Character Codes App-1
Appendix 2 Output Flow of FIFO Data App-2
Appendix 3 Output Flow of the File or the File List in the External Storage Medium App-4
Appendix 4 Login Process and Messages during the Login Process App-6
Appendix 5 Data Dropout (Modbus Master) App-9
Appendix 6 A List of Error Messages App-10

Index

1.1 Overview of the Communication Function Using the Ethernet Interface

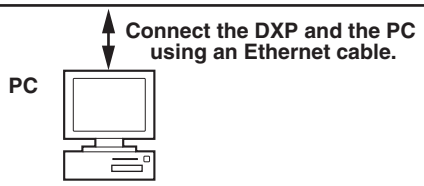
This section describes the communication function using the Ethernet interface that comes standard with the DXP. For a description of how to use the Ethernet interface, see chapter 2.

Functional Structure

The following figure shows the relationship between the communication function of the DXP and the Ethernet interface. To use the communication function of the DXP via the Ethernet interface, communications must be performed according to the protocol* that lies in between two.

* Protocol is a set of rules that two computers use to communicate via a communication line (or network).

<table>
<tr><td></td><td colspan="9">The communication functions of the DXP</td></tr>
<tr><td>Application</td><td>Setting/ Measurement server</td><td>Maintenance/ Test server</td><td>Web server</td><td>FTP server</td><td>FTP client</td><td>E-mail client</td><td>SNTP server</td><td>SNTP client</td><td>Instrument Information server</td></tr>
<tr><td>Upper layer protocol</td><td colspan="2">Dedicated protocol for the DXP</td><td>HTTP</td><td colspan="2">FTP</td><td>SMTP</td><td colspan="2">SNTP</td><td></td></tr>
<tr><td>Lower layer protocol</td><td colspan="7">TCP</td><td colspan="2">UDP</td></tr>
<tr><td></td><td colspan="9">IP</td></tr>
<tr><td>Interface</td><td colspan="9">Ethernet interface (10BASE-T)</td></tr>
</table>



FTP (File Transfer Protocol)
TCP (Transmission Control Protocol)
UDP (User Datagram Protocol)
IP (Internet Protocol)
HTTP (Hyper Text Transfer Protocol)
SMTP (Simple Mail Transfer Protocol)
SNTP (Simple Network Time Protocol)

Connection to the Server Functions

Register at least an administrator to use the login function of the DXP (see section 4.4 in the DX100P/DX200P User's Manual).

To connect to the setting/measurement server, FTP server, or maintenance/test server, you are required to log in using the user information registered on the DXP. Only users that are allowed to log in via communications can log in.

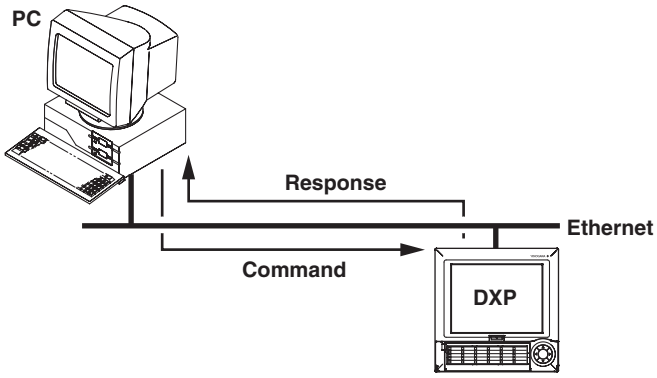
You do not have to log in when connecting to the SNTP server. Time information can be retrieved from the DXP according to the settings on the client machine.

Note

If no administrators are registered, you cannot use the login function. To comply with 21 CFR Part11 of FDA, register at least one administrator when using the DXP.

Setting/Measurement Server

For the procedure in using the setting/measurement server, see section 2.7.



Setting Function and Monitor Function

The following two functions are available.

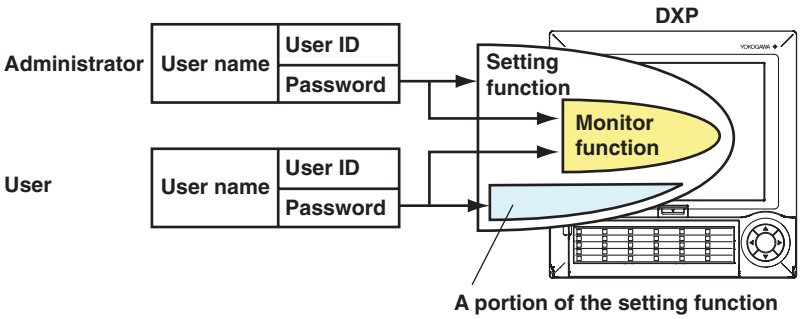
- **Setting Function**
  - **DXP Setup**
    Sets the engineering mode and system mode items of the DXP.
  - **DXP Operation**
    Operations that can be performed using keys of the DXP can be controlled. However, you cannot apply electronic signature to measured/computed data or switch the DXP screen to the log screen.
  - **Output DXP Data**
    - The DXP data can be output.
      - Measured/computed data (outputs the newest data).
      - Log (Communication log, FTP log, error log, operation log, Web operation log, E-mail log, alarm summary, message summary, setting change log, and SNTP log)
      - Setup data
      - Screen image data of the DXP (snapshot)
      - Information on users that are logged into the DXP.
      - Status byte (shows the DXP status).
    - Data on the external storage medium can be output.
    - Measured/computed data can be output in BINARY or ASCII format. For a description of the data output format, see chapter 6.
- **Monitor Function**
  The operations described in “Output DXP data” can be carried out. You cannot set or control the DXP.

Dedicated Commands

Uses dedicated commands for the DXP. See chapter 5.

Login

To use the setting/measurement server, log into the setting function or monitor function by entering a user name, user ID, and password that are registered in the DXP.



- Administrators or users can log into the setting function.
  - Multiple users cannot log in simultaneously.
  - If an administrator or user is already logged in using the keys on the DXP, you cannot log into the setting function.
  - Login is not possible if there is a user logged into the setting function via the serial interface.
  - Users can only execute a portion of the control commands (see section 2.7) such as starting/stopping data acquisition.
- An administrator or a user can log into the monitor function. Up to two users can log in at once.
- You cannot log in using the same user name.

Communication Timeout

This function drops the connection if no data transfer is detected between the PC and the DXP over a predetermined period of time. This applies to data transfer at the application level only (see page 1-1). For example, this prevents a PC from being connected to the DXP indefinitely which would prohibit other users from making new connections.

For the configuration required to use this function, see section 2.6.

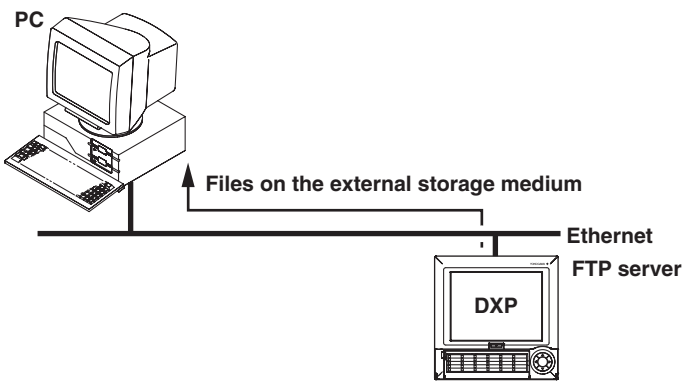
Keepalive (Extended Function of TCP)

This function forcibly drops the connection if there are no responses to the test packets that are sent periodically at the TCP level.

For the configuration required to use this function, see section 2.6.

FTP Server

You can access the DXP from the PC and retrieve files on the external storage medium of the DXP. For a description of how to use the FTP server, see section 2.8.



Login

To user the FTP server, you log in using a user name, user ID, and password that are registered in the DXP.

Communication Timeout

See “Setting/Measurement server.”

Keepalive (Extended Function of TCP)

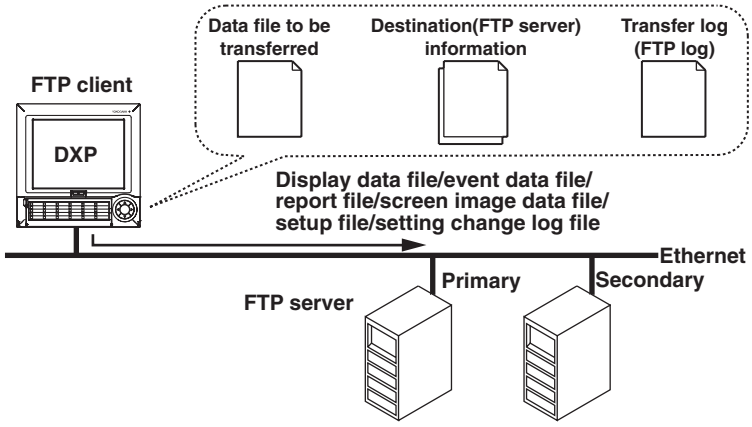
See “Setting/Measurement server.”

FTP Client

For the procedure in using the FTP client, see section 2.9.

Automatic File Transfer

- The display data file, event data file, and report file can be automatically transferred to a remote FTP server. Setup file when settings are changed and the setting change log file can also be transferred to an FTP server. The result of the transfer is confirmed on the FTP log screen (see paragraph “Other functions” described later).
- Up to two file transfer destinations (FTP servers) can be specified (primary and secondary). If the primary server is down, the file is transferred to the secondary server.



FTP Test

- The file transfer can be checked by transferring a test file from the DXP to a remote FTP server.
- The result of the FTP test can be confirmed on the FTP log screen.

Web Server

The DXP screen can be displayed on the browser applications of Microsoft Internet Explorer. For the procedure in using the Web server, see section 2.11.

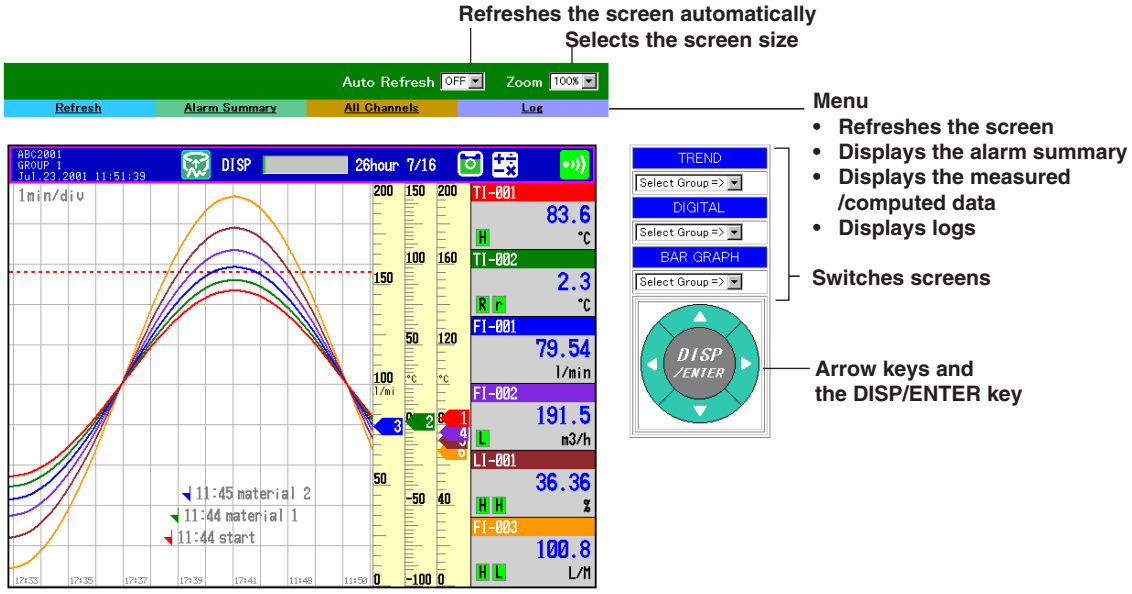
Two Screens

The following two screens are available. The screen can be updated at a constant period (approximately 30 s).

- **Monitor Page**
  Screen dedicated for monitoring. The following information can be displayed.
  - Alarm summary
  - Measured/computed data of all channels
  - Logs (Message summary, error log, FTP log, e-mail log, Web operation log, setting change log, SNTP log)
- **Operator Page**
  When using the login function
  In addition to the functions on the monitor page, the operation of switching the DXP display is possible.
  When not using the login function (no administrators are registered)
  In addition to the functions on the monitor page, the operation of switching the DXP display, ACK operation of individual alarms, and write operation of free messages are possible.

Access Control

You can set access control (user name and password) on each page.



E-mail Transmission

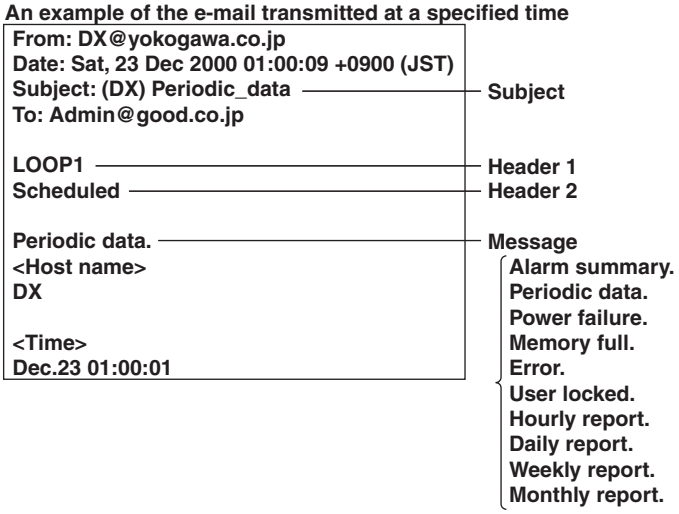
The DXP transmits e-mails to the specified destination. For a description of how to use the e-mail transmission function, see section 2.13.

Transmitting E-mail Messages

E-mail can be automatically transmitted at the following times. You can specify two groups of destinations and specify the destination for each item.

- **When Alarm Is Active/released**
  Notifies the alarm information.
- **During Recovery from a Power Failure**
  Notifies the time of the power failure and the time of recovery.
- **When Memory End Is Detected** (See section 1.8 of the DX100P/DX200P User's Manual)
  Notifies the detection of memory end.
- **When an Error Related to the External Storage Medium and FTP Client Occurs**
  Notifies the error code and message in the following cases.
  - When an error is detected on the external storage medium or when the data cannot be saved as the free space on the storage medium is insufficient.
  - When data transfer fails using the FTP client function.
  - When a user is locked due to password failure
- **At the Specified Time**
  Transmits an e-mail message when the specified time is reached. It can be used to confirm that the e-mail transmission including the network is working properly. You can specify the reference time and the e-mail transmission interval for each destination.

An example of the e-mail transmitted at a specified time



- **When Report Is Created (Only on Models with the Optional Computation Function (/M1)**
  Transmits the report.

Testing E-mail Transmission

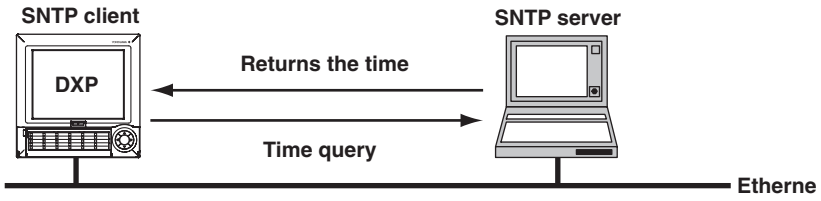
- You can send a test message from the DXP to the destination to check e-mail transmissions.
- You can confirm the result of the e-mail transmission test on the e-mail log screen (see paragraph "Other functions" described later).

SNTP Server

The DXP operates as an SNTP server. The DXP returns time information in response to a time query from a client machine on the network. The time resolution is 15.625 ms. For a description of how to set up and use this function, see sections 2.16 and 2.17.

SNTP Client

The time on the DXP can be synchronized to the time of an SNTP server on the network. For a description of how to set up and use this function, see sections 2.16 and 2.17.



Periodic Time Adjustment
Queries the time on a server at specified time intervals and synchronizes the time.

Setting the Time When Starting Measurements
Queries the time on a server when measurement is started and synchronizes the time.

Setting the Time Using Keys
Queries the time on a server at an arbitrary time and synchronizes the time. Only an administrator can carry out this operation.

Note

The operation of time correction varies depending on whether data acquisition is in progress. For details, see section 1.10 in the DX100P/DX200P User's Manual.

Maintenance/Test Server

For a description of how to use this function, see section 2.14.

Setting Function and Monitor Function

The following two functions are available.

- **Setting Function**
  - Output Ethernet communication information such as connection information and network information from the DXP.
  - Forcibly disconnect other users connected to the DXP.
- **Monitor Function**
  Output Ethernet communication information such as connection information and network statistics from the DXP.

Dedicated Commands

Uses dedicated commands for the DXP. See chapter 5.

Login

To use the maintenance/test server, log into the setting function or monitor function by entering a user name, user ID, and password that are registered in the DXP.

Communication Timeout

This function drops the connection if no data transfer is detected between the PC and the DXP for 15 minutes.

Instrument Information Server

The serial number and model of the DXP connected to Ethernet can be output. For the operating procedure, see section 2.15.

Other Functions

Confirming the Connection Status of the Ethernet Interface

- The connection status of the Ethernet interface can be confirmed on the rear panel and on the screen of the DXP.
- For the display position and the meaning of the indicator, see section 2.4.

Displaying Operation/Error/FTP/Communication/E-mail/Web operation/SNTP logs

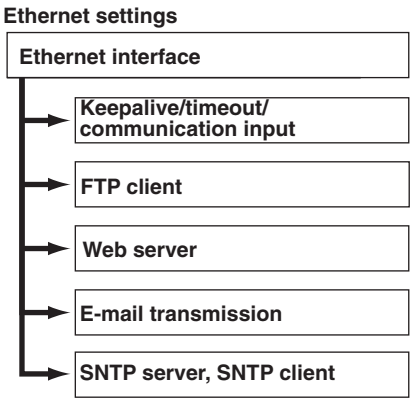
The operation log can be displayed on the following log screens.

- Operation log screen: A log of operations
- Error log screen: A log of operation errors
- Setting change log screen: A log of setting changes
- Communication log screen: A log of commands and responses executed using the setting/measurement server function
- FTP log screen: A log of file transfers that were executed using the FTP client function
- Web operation log screen: A log of operations on the Web pages
- E-mail log screen: A log of e-mail transmissions
- SNTP log screen: A log of access to the SNTP server

For the operating procedure to display the log screen, see section 8.9 of the DX100P/DX200P User's Manual.

Overview of the Configuration

The communication functions of the DXP can be used by setting the DXP according to the following figure.



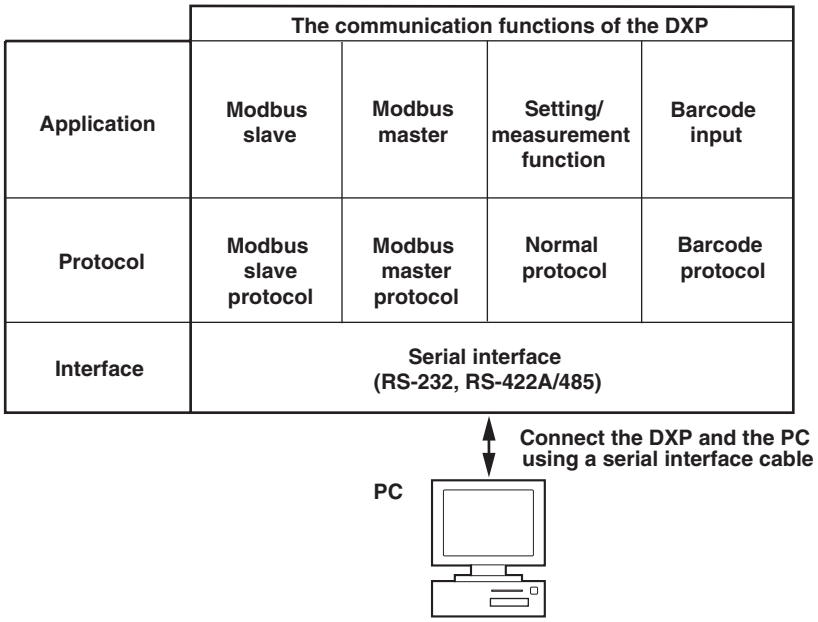
Ref. Sections	Functions Related
2.3	All functions
2.6	Setting/measurement server, FTP server
2.5	FTP client
2.10	Web server
2.12	E-mail transmission
2.16	SNTP server, SNTP client

1.2 Overview of the Communication Function Using the Serial Interface

This section describes the communication function using the serial interface (/C2, /C3 option). For a description of how to use the Ethernet interface, see chapters 3 and 4.

Functional Structure

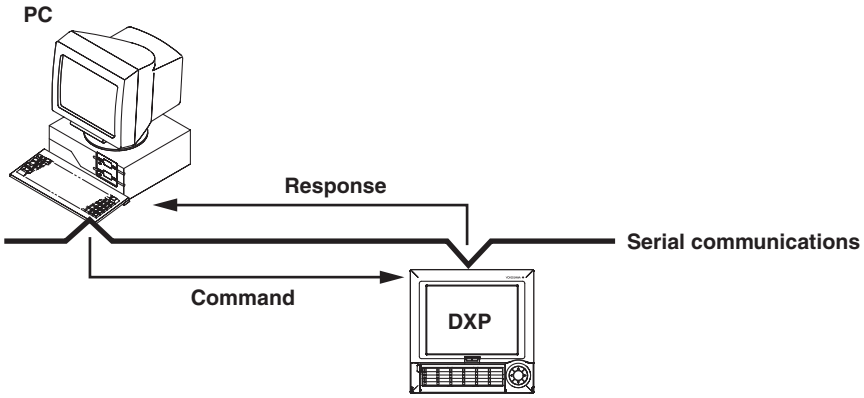
The following figure shows the relationship between the communication function of the DXP and the serial interface.



When using the serial communications, choose an application from the four in the above figure.

Setting/Measurement Function

The communication function using a normal protocol is the same as the function of the setting/measurement server on the Ethernet network. For a description of how to use the communication function using the normal protocol, see section 3.6.



Setting Function and Monitor Function

Two functions, setting function and monitor function, are available. The functions are the same as when using the Ethernet network. See page 1-2.

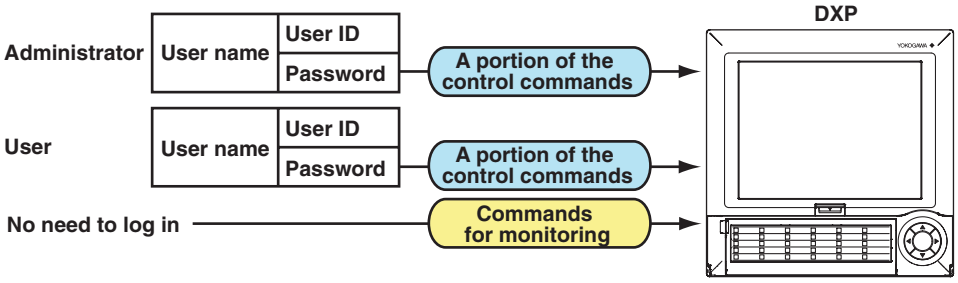
Dedicated Commands

Uses dedicated commands for the DXP. See chapter 5.

Connection

If you set the serial communication function of the DXP and connect the PC and the DXP, the DXP is ready to receive commands from the PC.

- If the DXP is configured to use the login function
  Monitor function commands (output commands) can be executed.
  In addition, a portion of the control commands of the setting function can be executed.
  Log into the DXP when executing control commands. The commands that you can execute vary depending on whether you are logged in as an administrator or a user. However, login is not possible in the following cases.
  - When an administrator or a user is already logged in using keys.
  - When there is a user logged into the setting function via the Ethernet interface

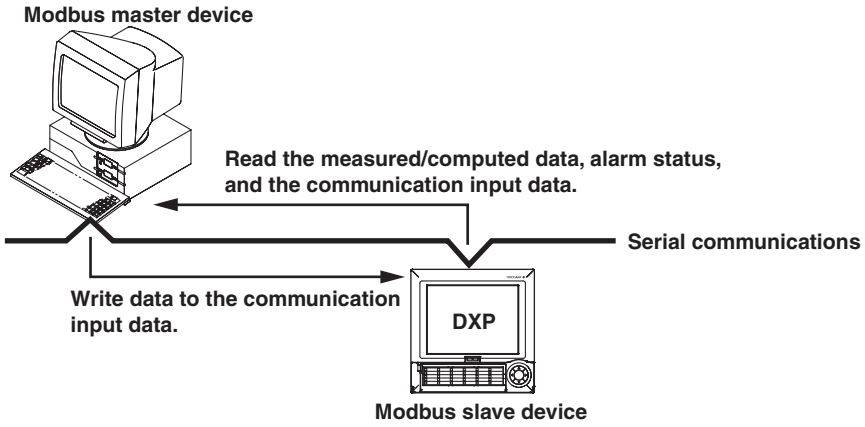


- If the DXP is configured not to use the login function (no administrators are registered), setting function commands can be executed.

Modbus Slave

For a description of how to use the communication function using the normal protocol, see chapter 4.

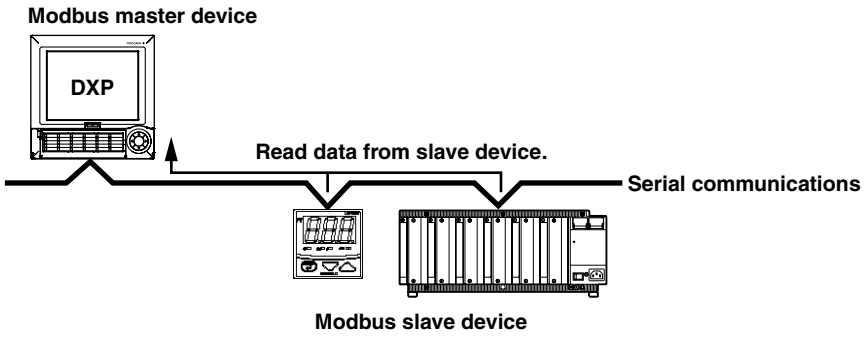
- The PC reads the measured/computed data and alarm status on the DXP.
- The PC writes data to the communication input data or reads the communication input data on the DXP.



Modbus Master

For a description of how to use the communication function using the normal protocol, see chapter 4.

- The DXP loads the measured data of other instruments. The loaded data can be handled as communication input data of the computation function (/M1 option) on the computation channel.
- Function for writing data to other instruments is not supported.



Barcode Input

You can control the DXP by reading barcodes* instead of using the front panel keys. For the operating procedure, see section 3.7.

* A barcode reader is required.

- You can enter character strings when a character input window is shown on the DXP screen.
- You can set batch numbers, lot numbers, and batch comments.
- You can write arbitrary messages.
- You can simplify the login procedure by entering the user name or the user name and user ID using barcodes.
- You can operate individual keys.
- You can execute the output of measured/computed data, logs, and other types of data.

Displaying Error/Communication/FTP/Web operation/E-mail logs

The operation log can be displayed on the following log screens.

- Operation log screen: A log of operations
- Error log screen: A log of operation errors
- Setting change log screen: A log of setting changes
- Communication log screen: A log of commands and responses executed using the setting/measurement server function.

For the operating procedure to display the log screen, see section 8.9 of the DX100P/DX200P User's Manual.

Overview of the Configuration

For the setting procedure, see sections 3.5, 4.4, and 4.5.

2.1 Ethernet Interface Specifications

Basic Specifications

Electrical and mechanical specifications	Conforms to IEEE 802.3 (Ethernet frames conform to the DIX specifications.)
Transmission medium type	10BASE-T
Protocol	TCP, IP, UDP, ICMP, ARP

Server Functions and Client Functions

Server Functions and the Maximum Number of Connections

The following table indicates the maximum number of connections, and the port number for each function.

Function	Maximum Number of Connections	Port Number*1
Setting/measurement server	3*2	34260/tcp
Maintenance/test server	1	34261/tcp
FTP server	2	21/tcp
Web server	1	80/tcp
Instrument information server	–	34264/udp
SNTP server	–	123/udp

*1 You cannot changed the port number.
*2 Only a single person can connect to the setting function at any given time. Up to two persons can connect to the monitor function at any given time.

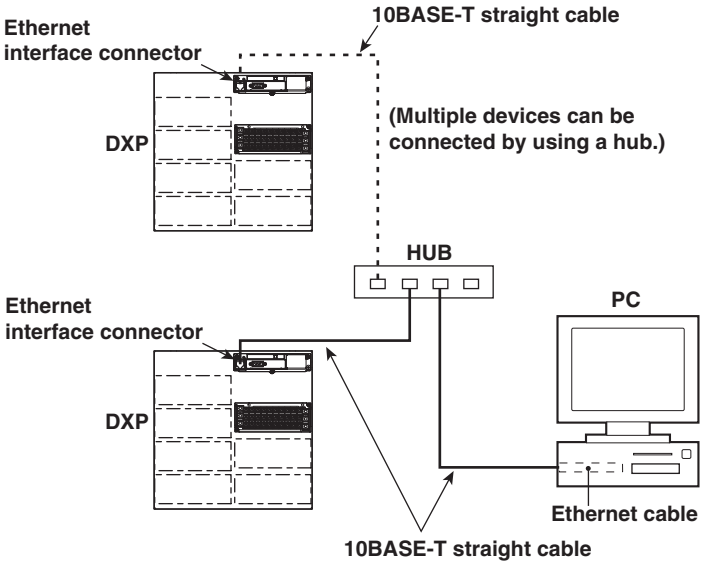
Client Functions

- FTP client
- E-mail transmission (e-mail client)
- SNTP client

2.2 Connecting the Ethernet Interface

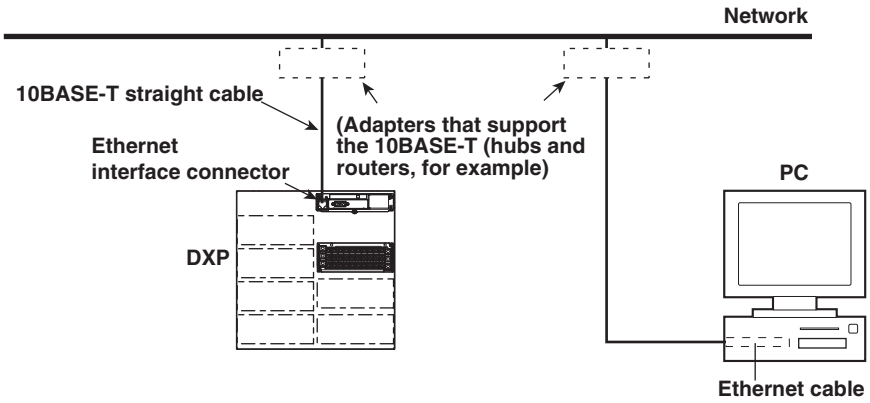
When Connecting Only the DXP and A PC

Connect the DXP and the PC via a HUB as in the following figure.



When Connecting to A Preexisting Network

The following figure illustrates an example in which the DXP and a PC are connected to the network. When connecting the DXP or the PC to a preexisting network, the transfer rate, connector type, etc. must be matched. For details, consult your system or network administrator.



Note

- Communications may take time depending on the network conditions such as when data traffic is excessively high or when communication is affected by external noise.
- Communication performance deteriorates if multiple PCs access the recorder simultaneously.

2.3 Configuring the Ethernet Interface

Explanation

The following configurations must be made in order to use the Ethernet communication functions of the DXP.

Setting the IP address, subnet mask, default gateway, and DNS

Confirm the settings such as the IP address, subnet mask, default gateway, and DNS with the administrator of the system or network on which the recorder is to be used.

- **IP address**
  - Set the IP address to assign to the DXP. The default setting is "0.0.0.0."
  - The IP address is used to distinguish between the various devices connected to the Internet when communicating using the TCP/IP protocol. The address is a 32-bit value normally expressed with four values (0 to 255), each separated by a period as in 192.168.111.24.
- **Subnet mask**
  - Specify the mask that is used to determine the network address from the IP address. The default setting is "0.0.0.0."
  - Set this value according to the system or the network to which the DXP belongs. In some cases, this setting may not be necessary.
- **Default gateway**
  - Set the IP address of the gateway (router, etc.) used to communicate with other networks. The default setting is "0.0.0.0."
  - Set this value according to the system or the network to which the DXP belongs. In some cases, this setting may not be necessary.
- **DNS (Domain Name System)**

  You must set the DNS if you are using host names to specify the destination server of the file transfer on an FTP client, the server of the e-mail recipient, or the SNTP server.

  * The DNS is a system that correlates the host name/domain name to the IP address. The host name/domain name can be used instead of the IP address when accessing the network. The DNS server manages the database that contains the host name/domain name and IP address correlation.

  - **DNS server**
    - Set the address of the DNS server. The default setting is "0.0.0.0."
    - Up to two DNS servers can be specified (primary and secondary). If the primary DNS server is down, the secondary server is used to search the host name/domain name and IP address.
  - **Host name**

    Set the DXP's host name using up to 64 alphanumeric characters.
  - **Domain name**
    - Set the network domain name to which the DXP belongs using up to 64 alphanumeric characters.
    - When the destination server of the file transfer, the server of the e-mail recipient, or the SNTP server is looked up using the DNS server, this domain name is appended to the host name as a possible domain name if it is omitted . The destination name (server name) becomes the "FTP server name" (see section 2.5), the "SMTP server name" (see section 2.12), or the "Server name" (see section 2.16).

- **Domain suffix**
  If the IP address corresponding to the “domain name,” described in the previous paragraph, is not found on the DNS server, then it may be that the system is configured to use another domain name. In this case, the domain suffix is specified, so that this domain name is searched after the “domain name” specified in the previous paragraph is searched.
  - Set the domain suffix using up to 64 alphanumeric characters.
  - Up to two domain suffixes can be specified (primary and secondary).

Memory out*1

Select the communication type, Ethernet communications or serial communications, used to output the data on the external storage medium of the DXP using the ME command.*2

Select [Ethernet]. *3

*1 This item appears if the serial communication function (/C2 or /C3 option) is equipped.

*2 This command can be used on either the Ethernet communications or serial communications.

*3 When the login function is enabled (when any of administrators are registered), the ME command cannot be used via the serial communications.

Storing the settings

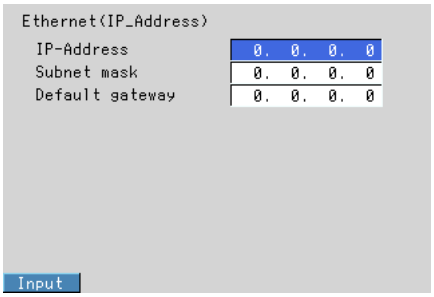
To activate the settings made in the system mode, the settings must be saved. Otherwise, the settings return to the previous values.

Procedure

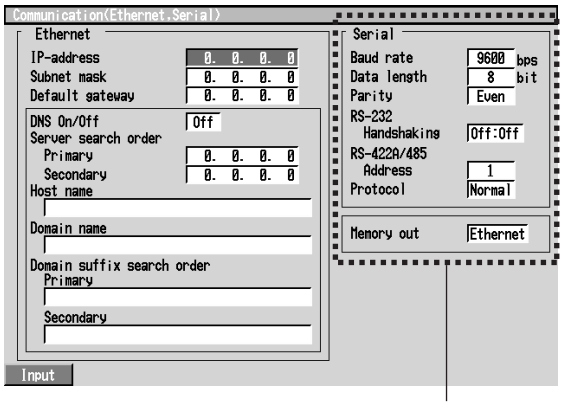
For the basic flow of operations, see “Flow of Operation using the Operation Keys” on page vi. For the procedures related to entering character strings and values, see the DX100P/DX200P User’s Manual (IM04L05A01-01E/IM04L06A01-01E).

1. Enter the system mode.
2. Press the [#8 (Communication)](DX100P) or [#6 (Communication)](DX200P) soft key to display the communication function setting menu.
3. Press the [#1 (Ethernet (IP Address))](DX100P) or [#1 (Ethernet, Serial)](DX200P) soft key to display the communication (Ethernet, serial) menu.

DX100P Communication (Ethernet) menu



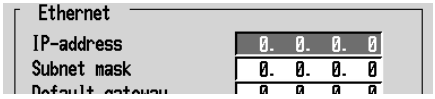
DX200P Communication (Ethernet, Serial) menu



These setting items are not displayed for the models without the serial communication function (/C2 or /C3).

Setting the IP address

4. Press the arrow key to move the cursor to the [IP-address] box.



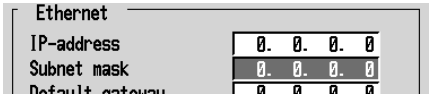
5. Press the [Input] soft key to display the entry box.

6. Enter the IP address of the DXP in the entry box.
7. Press the DISP/ENTER key. The entered value is set in the [IP-address] box.

Setting the subnet mask

Set this value according to the system or the network to which the DXP belongs. If this setting is not necessary, go to “Setting the default gateway.”

8. Press the arrow key to move the cursor to the [Subnet mask] box.



9. Press the [Input] soft key to display the entry box.

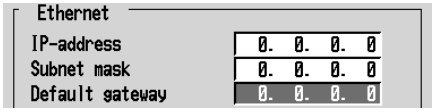
10. In the entry box, enter the subnet mask of the network to which the DXP belongs.

11. Press the DISP/ENTER key. The entered value is set in the [Subnet mask] box.

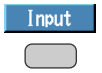
Setting the default gateway

Set this value according to the system or the network to which the DXP belongs. If this setting is not necessary, go to "Setting the DNS (Domain Name System)."

12. Press the arrow key to move the cursor to the [Default gateway] box.



13. Press the [Input] soft key to display the entry box.



14. In the entry box, enter the default gateway of the network to which the DXP belongs.

15. Press the DISP/ENTER key. The entered value is set in the [Default gateway] box.
    For DX100P, confirm the new settings pressing the DISP/ENTER key. To cancel, press the ESC key.
    For detailed operations regarding confirmation and cancellation, see "Flow of Operation using the Operation Keys" on page vi.

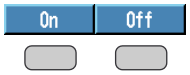
Setting the DNS (Domain Name System)

Set the DNS, if you are using a host name to specify the destination server of the file transfer on an FTP client or the server of the e-mail recipient.
If the DNS is not going to be used, go to step 38 (for models with the serial communication function) or step 40 (for models without the serial communication function).
For the DX100P, when settings are confirmed by step 15, press the ESC key to return to the communication function setting menu, and then press the [#2 (Ethernet (DNS))] soft key to display the communication (DNS) menu.

- **Select whether or not to use the DNS (ON/OFF)**

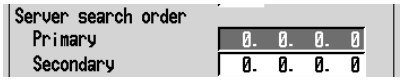
16. Press the arrow key to move the cursor to the [DNS On/Off] box.

17. Press either the [On] or [Off] soft key. When using the DNS, select [ON] and perform steps 18 through 37. Otherwise, select [Off] (you can skip steps 18 through 37).

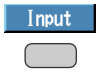


- **Setting the primary DNS server address**

18. Press the arrow key to move the cursor to the [Primary] box under server search order.



19. Press the [Input] soft key to display the entry box.



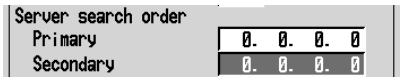
20. Enter the primary DNS server address in the entry box.

21. Press the DISP/ENTER key. The entered value is set in the [Primary] box.

- **Setting the secondary DNS server address**

  Set this value when using the secondary DNS server in the system or the network to which the DXP belongs. If this setting is not necessary, go to step 24.

22. Press the arrow key to move the cursor to the [Secondary] box under server search order.

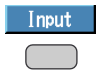


23. Set the secondary DNS server address using the same method from steps 19 through 21.

- **Setting the DXP's host name**

24. Press the arrow key to move the cursor to the [Host name] box.

25. Press the [Input] soft key to display the entry box.



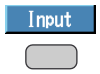
26. Enter the DXP's host name in the entry box.

27. Press the DISP/ENTER key. The entered string/value is set in the [Host name] box.

- **Setting the domain name to which the DXP belongs**

28. Press the arrow key to move the cursor to the [Domain name] box.

29. Press the [Input] soft key to display the entry box.



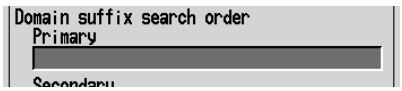
30. Enter the DXP's domain name in the entry box.

31. Press the DISP/ENTER key. The entered string/value is set in the [Domain name] box.

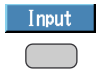
- **Setting the primary domain suffix**

  Set this value when the domain suffix is necessary. Otherwise, go to step 38.

32. Press the arrow key to move the cursor to the [Primary] box under Domain suffix search order.



33. Press the [Input] soft key to display the entry box.

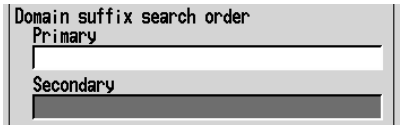


34. Enter the primary domain suffix in the entry box.

35. Press the DISP/ENTER key. The entered value is set in the [Primary] box.

- **Setting the secondary domain suffix**
  Set this value when the secondary domain suffix exists. If this setting is not necessary, go to step 38.

36. Press the arrow key to move the cursor to the [Secondary] box under Domain suffix search order.



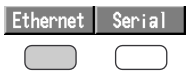
37. Set the secondary domain suffix in the same fashion as in steps 33 to 35.

Setting the [Memory out]

The [Memory out] is displayed if the serial communication function is equipped.

38. Press the arrow key to move the cursor to the [Memory out] box.

39. Press the [Ethernet] soft key.



Confirming/Canceling the new settings

40. To confirm the new settings, press the DISP/ENTER key. To cancel, press the ESC key.
    For detailed operations regarding confirmation and cancellation, see “Flow of Operation using the Operation Keys” on page vi.

Storing the new settings

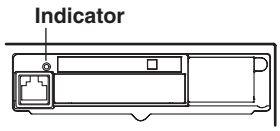
See “Flow of Operation using the Operation Keys” on page vi.

2.4 Checking the Connection Status of the Ethernet Interface

Checking the Connection Status Using the Rear Panel

The connection status of the Ethernet interface can be confirmed with the indicator that is located to the upper right of the Ethernet connector on the DXP.

Indicator	Connection Status of the Ethernet Interface
On (green)	The Ethernet interface is electrically connected.
Blinking (green)	Transmitting data
Off	The Ethernet interface is not electrically connected.



(Rear Panel)

Checking the Connection Using the DXP's Screen

Checking using the status display of the screen

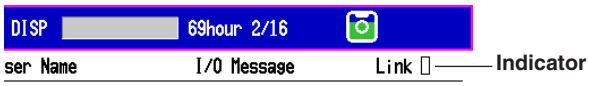
The connection status of the Ethernet interface can be checked using the indicator located on the right hand side of the status display section of the system mode menu. For the procedure to display the system mode menu, see "Entering the System Mode" on page vi.

Indicator	Connection Status of the Ethernet Interface
On (green)	The Ethernet interface is electrically connected.
Off	The Ethernet interface is not electrically connected.

Checking using the display section located at the upper right corner of the communication log screen

The connection status of the Ethernet interface can be checked using the indicator located at the upper right corner of the communication log screen. For the procedures on how to display the communication log, see section 8.9 of the DX100P/DX200P User's Manual.

Indicator	Connection Status of the Ethernet Interface
On (green)	The Ethernet interface is electrically connected.
Off	The Ethernet interface is not electrically connected.



2.5 Setting the FTP Client

Explanation

The display data files, event data files, and other files on the DXP can be transferred automatically to an FTP server when the file is created. Note that the Ethernet interface must be configured beforehand (see section 2.3).

Selecting the files to transfer

You can select whether or not to automatically transfer the display/event data file, the report data file, and the screen image data file. The default setting is [Off].
If the DXP is configured to automatically transfer individual display/event data files, the setup file when settings are changed and the setting change log file are also automatically transferred.

Setting the FTP connection

Confirm the settings such as the primary and secondary FTP servers, port number, login name, password, account, PASV mode, and initial path with your system or network administrator.

- **Setting the primary and secondary servers**
  Specify the primary and secondary file transfer destinations (FTP servers) as described in the previous close. When the primary FTP server is down, the data are transferred to the secondary FTP server.
- **FTP server name**
  Set the FTP server name using up to 64 alphanumeric characters.
  - When the DNS is being used, the host name can be used to specify the server name.
  - For DNS settings, see section 2.3.
  - You can also specify the IP address. In this case, DNS is not necessary.
- **Port number**
  Set the port number of the destination FTP server in the range from 1 to 65535. The default setting is 21.
- **Login name**
  Set the login name to use when accessing the FTP server. Up to 32 alphanumeric characters can be used.
- **Password**
  Set the password to use when accessing the FTP server. Up to 32 alphanumeric characters can be used.
- **Account**
  Set the account (the ID number) to use when accessing the FTP server. Up to 32 alphanumeric characters can be used.
- **PASV mode**
  When using the DXP behind a firewall that requires the PASV mode, turn this mode [On]. A firewall is a security feature on a router which is used to prevent undesired intrusion into the network from outside parties.
- **Initial path**
  Set the destination directory for the file transfer using up to 64 alphanumeric characters. The directory delimiter varies depending on the FTP server.
  Example: When transferring files to the directory “data” which is a sub directory of the “home” directory on a UNIX file system, use the forward slash “/” as the directory delimiter:
  `/home/data`

Storing the settings

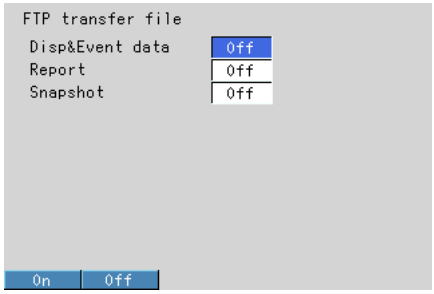
To activate the settings made in the system mode, the settings must be saved. Otherwise, the settings return to the previous values.

Procedure

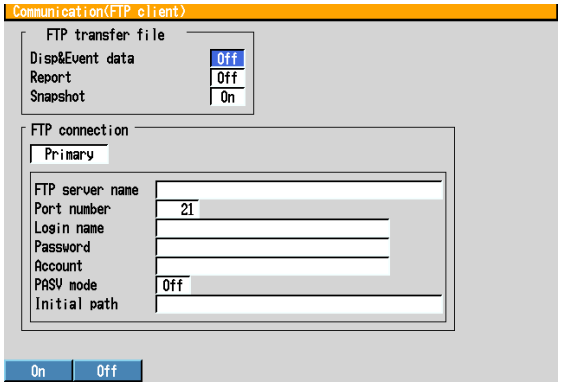
For the basic flow of operations, see “Flow of Operation using the Operation Keys” on page vi. For the procedures related to entering character strings and values, see the DX100P/DX200P User’s Manual (IM04L05A01-01E/IM04L06A01-01E).

1. Enter the system mode.
2. Press the [#8 (Communication)](DX100P) or [#6 (Communication)](DX200P) soft key to display the communication function setting menu.
3. Press the [#3 (FTP transfer file)](DX100P) or [#2 (FTP Client)](DX200P) soft key to display the Communication (FTP client) menu.

DX100P Communication (FTP tramsfer file)



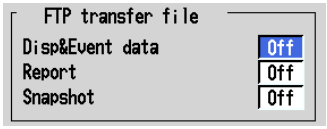
DX200P Communication (FTP client)



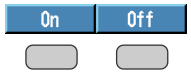
Selecting the files to be transferred

- **Selecting whether to transfer the display/event data files, setup files when settings are changed, and setting change log files (On/Off)**

4. Press the arrow key to move the cursor to the [Disp&Event data] box.



5. Press either the [On] or [Off] soft key.



- **Selecting whether or not to transfer the report data file (ON/OFF)**

6. Set whether or not to transfer the report data file using the same method as steps 4 and 5.

- **Selecting whether or not to transfer the screen image data file (ON/OFF)**

7. Set whether or not to transfer the screen image data file using the same method as steps 4 and 5.

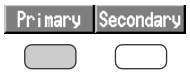
   For the DX100P, confirm the new settings pressing the DISP/ENTER key. To cancel, press the ESC key.
   For detailed operations regarding confirmation and cancellation, see “Flow of Operation using the Operation Keys” on page vi.

Setting the primary FTP server

For DX100P, when settings are confirmed by procedure 7, press the ESC key to return to the communication function setting menu, and then press the [#4 (FTP connection)] soft key to display the communication (FTP connection) menu.

8. Press the arrow key to move the cursor to the [FTP connection] box.

9. Press the [Primary] soft key.



- **Setting the FTP server name**

10. Press the arrow key to move the cursor to the [FTP server name] box.

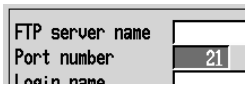
11. Press the [Input] soft key to display the entry box.

12. Enter the primary FTP server name in the entry box. Generally, the IP address is entered. However, if DNS is being used, the FTP server's host name can also be specified.

13. Press the DISP/ENTER key. The entered string/value is set in the [FTP server name] box.

- **Setting the FTP server's port number**

14. Press the arrow key to move the cursor to the [Port number] box.



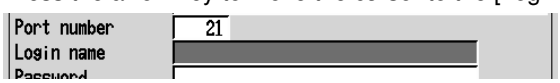
15. Press the [Input] soft key to display the entry box.

16. Enter the port number of the primary FTP server in the entry box.

17. Press the DISP/ENTER key. The entered value is set in the [Port number] box.

- **Setting the login name used when accessing the FTP server**

18. Press the arrow key to move the cursor to the [Login name] box.



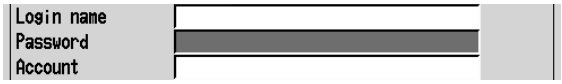
19. Press the [Input] soft key to display the login name entry box.

20. Enter the login name that is used when accessing the primary FTP server in the entry box.

21. Press the DISP/ENTER key. The entered string/value is set in the [Login name] box.

- **Setting the password used when accessing the FTP server**

22. Press the arrow key to move the cursor to the [Password] box.



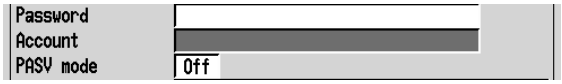
23. Press the [Input] soft key to display the entry box.

24. Enter the password that is used when accessing the primary FTP server in the entry box.

25. Press the DISP/ENTER key. The entered string/value is set in the [Password] box.

- **Setting the account used when accessing the FTP server**

26. Press the arrow key to move the cursor to the [Account] box.



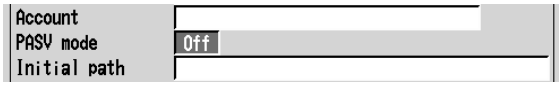
27. Press the [Input] soft key to display the entry box.

28. Enter the account that is used when accessing the primary FTP server in the entry box.

29. Press the DISP/ENTER key. The entered string/value is set in the [Account] box.

- **Enabling (On)/Disabling (Off) the PASV mode**

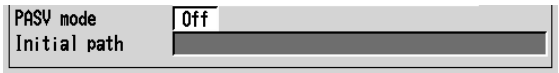
30. Press the arrow key to move the cursor to the [PASV mode] box.



31. Press either the [On] or [Off] soft key.

- **Setting the initial path (file transfer destination directory)**

32. Press the arrow key to move the cursor to the [Initial path] box.



33. Press the [Input] soft key to display the entry box.

34. Enter the file transfer destination directory in the entry box.

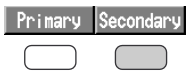
35. Press the DISP/ENTER key. The entered string/value is set in the [Initial path] box.

Setting the secondary FTP server

Set the secondary FTP server when specifying a secondary file transfer destination. If you are not using the secondary FTP server, go to step 39.

36. Press the arrow key to move the cursor to the [FTP connection] box.

37. Press the [Secondary] soft key.



38. Set the secondary FTP server using the same method from steps 10 through 35.

Confirming/Canceling the new settings

39. To confirm the new settings, press the DISP/ENTER key. To cancel, press the ESC key.

    For detailed operations regarding confirmation and cancellation, see “Flow of Operation using the Operation Keys” on page vi.

Storing the new settings

See “Flow of Operation using the Operation Keys” on page vi.

2.6 Setting Timeout/Keep Alive and the User That Is to Use the Communication Input Data

Explanation

Communication timeout

When using the DXP as a **setting/measurement server** or a **FTP server**, the DXP disconnects connections if there are no data transfer over a predetermined time period.

- **Enabling/Disabling the timer (ON/OFF)**
  - **On**
    Communication timeout is enabled.
  - **Off**
    Communication timeout is disabled.
- **Setting the timeout time**
  When the communication timeout is enabled and if no data transfer is detected over the time period specified here, the connection is dropped.
  Range: 1 to 120 minutes

Enabling/Disabling keepalive (On/Off)

- **On**
  If there is no response to the test packet that is periodically transmitted (every 30 s) at the TCP level, the connection is dropped.
- **Off**
  Keepalive is disabled.

Selecting Users That Are to Use the Communication Input Data

This setting applies to the **setting/measurement server** on Ethernet communications and the **setting/measurement function** on serial communications (/C2 or /C3 option).

Only the users specified here can enter values in the communication input data (DX100P: C01 to C12, DX200P: C01 to C30). Select from the following users.

- **Off**
  No users can use the communication input data.
- **Admin1 to Admin3, User1 to User30***
  A user that logs into the setting/measurement server** can use the communication input data.
  * User31 to User90 cannot be specified.
  ** If the login function is disabled (no administrators are registered), a user that connects to the setting function can use the communication input data.
- **Serial**
  A user that connects to the setting/measurement function using serial communications (/C2 or /C3 option) can use the communication input data. You can select [Serial] on models with the serial communications function.

Note

Select [Serial] when using the Modbus master function.

Storing the settings

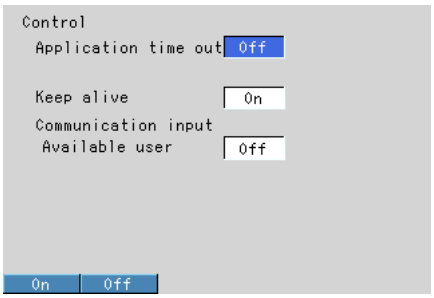
To activate the settings made in the system mode, the settings must be saved. Otherwise, the settings return to the previous values.

Procedure

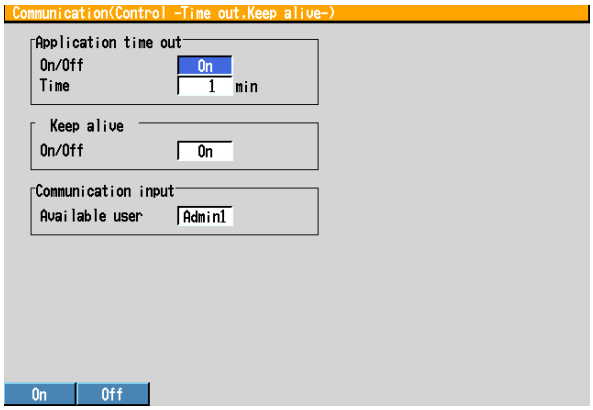
For the basic flow of operations, see “Flow of Operation using the Operation Keys” on page vi. For the procedures related to entering character strings and values, see the DX100P/DX200P User’s Manual (IM04L05A01-01E/IM04L06A01-01E).

1. Enter the system mode.
2. Press the [#8 (Communication)](DX100P) or [#6 (Communication)](DX200P) soft key to display the communication function setting menu.
3. Press the [#5 (Control)](DX100P) or [#3 (Control -Login, Timeout-)](DX200P) soft key to display the Communication (Control -Login, Time out) menu.

DX100P Communication (Control)



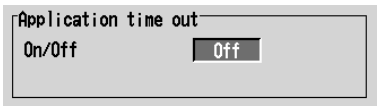
DX200P Communication (Control -Login, Time out)



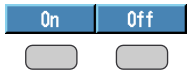
Setting the communication timeout

- **Enabling/Disabling communication timeout (On/Off)**

4. Press the arrow key to move the cursor to the [On/Off] box under communication timeout.

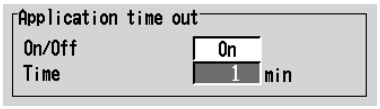


5. Press either the [On] or [Off] soft key. If you select [On], go to step 6. If you select [Off], go to step 10.



- **Setting the communication timeout time**

6. Press the arrow key to move the cursor to the [Time] box.



7. Press the [Input] soft key to display the entry box.

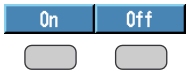
8. In the box, enter the communication timeout time.

9. Press the DISP/ENTER key. The entered value is set in the [Time] box.

Enabling/Disabling keepalive (On/Off)

10. Press the arrow key to move the cursor to the [On/Off] box under keepalive.

11. Press either the [On] or [Off] soft key.



Selecting users that are to use the communication input data

12. Press the arrow key to move the cursor to the [Available user] box.

13. Press one of the soft keys from [Off], [Admin1] to [User30].

Confirming/Canceling the new settings

14. To confirm the new settings, press the DISP/ENTER key. To cancel, press the ESC key.
    For detailed operations regarding confirmation and cancellation, see “Flow of Operation using the Operation Keys” on page vi.

Storing the new settings

See “Flow of Operation using the Operation Keys” on page vi.

2.7 Using the Setting/Measurement Server

Required Settings

The following settings are required when using the setting/measurement server on the Ethernet network.

- Section 2.3, “Configuring the Ethernet Interface”
- Section 2.6, “Setting Timeout/Keep Alive and the User That Is to Use the Communication Input Data”

Logging In

Explanation

Carry out the steps according to the PC, software, and network environment that you are using.
This section describes the step-by-step procedures on the PC for logging in and the responses from the DXP.
For a description of the flow of the login process, see appendix 4.

Login Conditions

Users that are registered in the DXP and are allowed to login via communications can log in.

- An administrator or a user can log into the setting function. However, a user can only execute some of the control commands.
  - Multiple users cannot log in simultaneously.
  - If an administrator or user is already logged in using the keys on the DXP, you cannot log into the setting function.
  - Login is not possible if there is a user logged into the setting function via the serial interface.
- An administrator or a user can log into the monitor function. Up to two users can log in at once.
- You cannot log in using the same user name.

Note

If you select a function (setting or monitor) when connecting to the DXP from the PC with no administrators registered, the DXP returns “E0” and is immediately ready to receive commands.

- If you select the setting function, it is equivalent to logging into the setting function at the administrator level. This is also true if you enter “admin” in place of “setting.”
- If you select the monitor function, it is equivalent to logging into the monitor function at the user level. This is also true if you enter “user” in place of “monitor.”

User Locked

If the login operation is carried out with a wrong password for three consecutive times, the user is invalidated. From that point, the user can no longer log in.

- **Clearing the User Locked Condition**
  Administrators can clear the user locked condition. For the procedure, see section 6.1 in the DX100P/DX200P User's Manual.

Error Messages

If an error message is displayed while logging in, see appendix 4 and carry out the corrective action.

DXP Operation Log

Operations are recorded in the DXP operation log.

Procedure

First Login

The password is set to the default password immediately after registering a user in the DXP login function. When logging in for the first time, you are prompted to change the password.

1. Specify the destination DXP using a host name or IP address. The port number (34260) is used to specify the setting/measurement server.
   The DXP returns the following message.
   E1 402 "Select function from 'setting' or 'monitor'."

2. To log into the setting function, enter "setting."
   To log into the monitor function, enter "monitor."
   The DXP returns the following message.
   E1 400 "Input username."

3. Enter the user name.
   The DXP returns the following message.
   E1 405 "Input user ID."

4. Enter the user ID.
   The DXP returns the following message.
   E1 401 "Input password."

5. Enter the default password.

User	Default Password
Administrator 1	Admin1
Administrator 2	Admin2
Administrator 3	Admin3
User 1	User01
User 2	User02
:	:
User 90	User90

   The DXP returns the following message.
   E1 407 "Password has expired. Please enter a new password."

6. Enter a new password.

Note

- The combinations of user IDs and passwords that are identical to those specified by other users or those that have been registered in the past cannot be specified.
- Enter the password using 6 to 8 alphanumeric characters.
- Spaces cannot be used for the password.

The DXP returns the following message.
E1 408 "Enter password again for confirmation."

7. Enter the password you entered in step 6.
   The DXP returns the following message.
   E0
   You are logged in.

Logging in after the First Time

1. Specify the destination DXP using a host name or IP address. The port number (34260) is used to specify the setting/measurement server.
   The DXP returns the following message.
   E1 402 "Select function from 'setting' or 'monitor'."

2. To log into the setting function, enter "setting."
   To log into the monitor function, enter "monitor."
   The DXP returns the following message.
   E1 400 "Input username."

3. Enter the user name.
   The DXP returns the following message.
   E1 405 "Input user ID."

4. Enter the user ID.
   The DXP returns the following message.
   E1 401 "Input password."

5. Enter the password.
   The DXP returns the following message.
   E0
   You are logged in.

   If the password has expired, you are requested to set a new password.
   The DXP returns the following message.
   E1 407 "Password has expired. Please enter a new password."

6. Enter a new password.

Note

- The combinations of user IDs and passwords that are identical to those specified by other users or those that have been registered in the past cannot be specified.
- Enter the password using 6 to 8 alphanumeric characters. Spaces cannot be used for the password.

The DXP returns the following message.
E1 408 "Enter password again for confirmation."

7. Enter the password you entered in step 6.
   The DXP returns the following message.
   E0
   You are logged in.

Sending Commands

Dedicated commands for the DXP are used.

Commands That Can Be Used

- **When logged into the setting function as an administrator**

Group	Commands that can be used	Ref. sections
Setting commands (engineering mode)	All	5.4
Setting commands (system mode)	All	5.5
Control commands	All except BV, BP, and KE commands	5.6
Output commands	All except CS command	5.7

Note

- The commands below can be executed even when data acquisition is in progress. However, the operation must be enabled in the DXP settings. For the setup procedure, see section 4.14 in the DX100P/DX200P User's Manual or the RC command.
  - User registration: EK, EL, and EI
  - Calibration correction: EH
  - Date and time setting: SD

  When using the EK, EL, EI, and EH commands, use the EE command to switch to the engineering mode, use the respective command to change the setting, and use the BE command to apply the setting and return to the operation mode. The SD command can be used in the operation mode or engineering mode.
  If the engineering mode display is shown when the DXP is configured to allow users to be registered, other logins (login to the setting/measurement server, FTP server, or maintenance/test server and login via the serial interface) are not possible.
- When the serial communication function (/C2 or /C3 option) is installed, the ME command can be executed on either the Ethernet or serial interface.
- The CM command can only used by a single specified user (see section 2.6).
- If the DXP is configured not to use the login function (no administrators are registered), commands for administrators can be executed. However, some commands such as those that set the range (SR, SO, SW, SK, SJ, BL, and BH commands) cannot be executed when data acquisition is in progress.

- **When logged into the setting function as a user**

Group	Commands That Can Be Used*	Ref. Section
Control commands	CC, UD, PS, AK, EV, MS, TL, EM, BB, BC, BJ, CM, SY, and LO	5.6
Output commands	All commands except CS	5.7

Note

- Commands that correspond to operations that are restricted for the logged-in user cannot be executed. The relationship between the commands and the setup items in login mode of a user is indicated below. For the setup procedure, see section 4.4 in the DX100P/DX200P User's Manual or the EL, BK, BM, and BF commands.

Command	Setup Item in Login Mode
UD	DISP/ENTER
PS0	START
PS1	STOP
AK	Alarm ACK
EV2	Snapshot
EV0, EV3, EV4	Save data
MS, BJ	Message
TL	Computation
EM	E-mail
BB, BC	Batch
SY	Other
LO	MENU

- The CM command can only used by a single specified user (see section 2.6).

- **When logged into the monitor function**

Group	Commands that can be used	Ref. sections
Control commands	CC and CM commands	5.6
Output commands	All except CS command	5.7

Note

The CM command can only used by a single specified user (see section 2.6).

For a description of the command syntax, see chapter 5; for a description of the responses, see chapter 6.

Main Functions and Commands That Are Used

- **Output the newest measured/computed data**

Command	Function
FD	Outputs the most recent measured/computed data in BINARY or ASCII format. When output in BINARY format, only the mantissa of the measured/computed data is output. The correct value is derived by combining with the decimal position information that is output using the FE command. Example: If the value is 12.345, “12345” is output in BINARY format.
BO	Specifies whether to output the BINARY data MSB first or LSB first.
FE	Outputs the decimal and unit information of the measured/computed data. This command is used when the data is output in BINARY format.

- **Output measured/computed data at a specified interval**

The DXP outputs the data in the FIFO (First-In First-Out) buffer. For a description of the FIFO buffer, see appendix 2.

Command	Function
FF	Outputs the mantissa of the measured/computed data in BINARY format. The correct value is derived by combining with the decimal position information that is output using the FE command. For an application example, see appendix 2, “Output Flow of FIFO Data.”
BO	See the description in “Output the newest measured/computed data.”
FE	See the description in “Output the newest measured/computed data.”

- **Output status information**

For a description of the status information, see chapter 7.

Command	Function
IS	Outputs the status information in ASCII format.
IF	Sets the status filter.

- **Start/Stop measurement and computation**

Command	Function
PS	PS0: Start measurement, PS1: Stop measurement
TL	TL0: Start computation, TL1: Stop computation

- **Write a message**

Command	Function
MS	Writes the registered character string (message).
BJ	Writes the specified character string (message).

- **Set the batch name**

Command	Function
BB	Sets the batch number and lot number.

Using the Output Data

The data retrieved from the DXP can be displayed in the following fashion.

File/Data	Location	Extension	Format*1	Viewing Method
Measured/computed data	Internal memory	-	BINARY*2 ASCII*3	Create a software for displaying*4 Create a software for displaying*5
Log*6	Internal memory	-	ASCII	Viewed using commercially sold software
Setup data	Internal memory	-	Undisclosed	Display using DAQSIGNIN

*1 For a description of the output format, see sections chapter 6.
*2 Measured/computed data and TLOG data output by the FD command; FIFO buffer data output by the FF command.
*3 Measured/computed data and TLOG data output by the FD command.
*4 Create a program for displaying the data by referring to the output format described in this manual.
*5 Create a program for displaying the data by referring to the output format described in this manual. Since the data is in ASCII format, a commercially sold software can be used to view the data.
*6 Communication log, FTP log, error log, operation log, Web operation log, E-mail log, alarm summary, message summary, setting change log, and SNTP log output by the FL command

Disconnecting from the DXP (Logging Out)

You are logged out in the following cases.

- **Log out by sending a command**
  Send the CC command.
- **When a command for exiting the system mode is executed**
  If you log into the setting function and initialize the setup data (EC command) or exit the system mode settings (YE command), you are logged out.
- **Log out according to the auto logout setting of the DXP**
  When logged into the setting function and no commands are sent for the time specified for the auto logout setting (see section 4.4 in the DX100P/DX200P User's Manual), you are automatically logged out.
- **When forcibly disconnected from the maintenance/test server**
  The maintenance/test server can drop the connection of other devices using the close command (see section 2.14).
- **Log out according to the communication timeout setting**
  See "Setting/Measurement Server" in section 1.1.
- **When a communication error occurs**
  When a transmission error, reception error, or timeout of the keep alive function (see "Setting/Measurement Server" in section 1.1) occurs, you are logged out.

Note

If you log out from the setting function, the DXP returns to the operation mode screen (logged out condition).

2.8 Using the FTP Server

Required Settings

Follow the procedures below to use the FTP server function.

- Section 2.3, “Configuring the Ethernet Interface”
- Section 2.6, “Setting Timeout/Keep Alive and the User That Is to Use the Communication Input Data”

Logging In

Explanation

Login Conditions

- Users that are registered in the DXP and are allowed to login via communications can log in.
- Users that are registered in the DXP can log in.
- Up to two users can log in at once.
- You cannot log in using the same user name.
  If the user is already logged in using the keys on the DXP or if the user is already logged into the setting/measurement server, maintenance/test server, or FTP server, the user cannot log in.
- Login is not possible in the following cases. Reset the password using the keys on the DXP or the setting/measurement server before logging into the FTP server.
  - When the password is set to default.
  - When the password is expired.
- The items that you can operate are the same whether you log in as an administrator or a user.

Note

If the login function is not used (no administrators are registered), you can login using the user name “admin” (administrator level), “user”, or “anonymous.” Password is not required when logging in (you can log in regardless of whether a password is entered).

User Locked

If the login operation is carried out with a wrong password for three consecutive times, the user is invalidated. From that point, the user can no longer log in.

- **Clearing the User Locked Condition**
  Administrators can clear the user locked condition. For the procedure, see section 6.1 in the DX100P/DX200P User’s Manual.

Error Messages

If an error occurs during login operation, the DXP returns an FTP error code as a response. If an error occurs, see the DXP error log and error message (see appendix 4) and carry out the corrective action.

DXP Operation Log

Operations are recorded in the DXP operation log.

Procedure

Carry out the steps according to the PC, software, and network environment that you are using. Here the requirements of the login operation are described.

Specifying the Connection Destination

Specify the destination DXP using a host name or IP address.
The port number (21) is used to specify the FTP server.
The password is specified as follows:

- **When the DXP is configured to use the user ID**
  Use the combination of the user ID and password that is registered in the DXP as the password for logging into the FTP server.
  Example: If the user ID is “5555” and the password is “AAAAAAAA”, the password used to log into the FTP server is “5555AAAAAAAA”.
- **When the DXP is configured not to use the user ID**
  Use the password registered in the DXP.

Displaying the Directory of the External Storage Medium/Retrieving Files

Follow the operating procedures for the software program that you are using.

Note

If the login function is not used (no administrators are registered), you can transfer files to the external storage medium of the DXP by logging in using the user name “admin”.

Using the Retrieved Files

The following table indicates the format and the display method of the files output by the FTP server function.

File/Data	Location	Extension	Format	Viewing Method
Display data file	External	DBD	Undisclosed	Viewed using DAQSIGNIN.
Event data file	External	DED	Undisclosed	Viewed using DAQSIGNIN.
Report file (A report data set)	External	DHR DDR DWR DMR	ASCII*	Viewed using commercially sold software
Manual sampled data file	External	DMN	ASCII*	Viewed using commercially sold software
TLOG data file	External	DTG	Undisclosed	Viewed using DAQSIGNIN.
Setup file	External	PPL	Undisclosed	Viewed using DAQSIGNIN.
Setting change log file	External	DPL	ASCII**	Viewed using commercially sold software
Screen image data file	External	PNG	PNG format	Viewed using commercially sold software

* For a description of the output format, see appendix 2 in the DX100P/DX200P User’s Manual.
** For a description of the output format, see section 6.2.

Disconnecting the Connection (Logging Out)

Follow the operating procedures for the software program that you are using to drop the connection.

You are automatically logged out in the following cases.

- **When forcibly disconnected from the maintenance/test server**
  The maintenance/test server can drop the connection of other devices using the close command (see section 4.5).
- **When a communication error occurs**
  When a transmission error, reception error, or timeout of the keep alive function (see “Setting/Measurement Server” in section 1.1) occurs, you are logged out.
- **Log out according to the communication timeout setting**
  See “Setting/Measurement Server” in section 1.1.

Note

The auto logout setting of the DXP is unrelated to the FTP server.

2.9 Using the FTP Client

Required Settings

Follow the procedures below to use the FTP client function.

- Section 2.3, “Configuring the Ethernet Interface”
- Section 2.5, “Setting the FTP Client”

Performing the FTP Test

Explanation

You can check whether or not files can be transferred via the Ethernet interface by transferring a test file from the DXP to the FTP server that was configured in section 2.5.

Items to check before performing this test

- Correctly connect the Ethernet cable. For the connection procedures, see section 2.2.
- Check that the Ethernet interface configuration is correct. For the procedures, see section 2.3 and 2.5.

When configuring Ethernet related settings, check them with the administrator of the system or network on which the DXP is to be used.

Checking the FTP test results

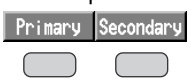
- The test file is transferred to the initial path on the destination FTP server that was specified in section 2.5. After the FTP test completes, check whether or not the test file was received on the FTP server
- The result of the FTP test can be confirmed by displaying the FTP log (displayed on the DXP (see section 8.9 of the DX100P/DX200P User’s Manual)) or Web screen (see section 2.11) or by outputting the logs using the FL command (see section 2.7).

Procedure

1. Press the FUNC key to display the FUNC menu. The construction of the FUNC menu varies depending on the basic settings and options.

2. Press the [FTP test] soft key to display a menu used to select the destination on which the FTP test to be performed.

3. Press either the [Primary] or [Secondary] soft key. The FTP test is performed on the specified FTP server.



Transferring Files

Starting

When you complete the FTP client settings, the DXP is ready to transfer files.

File transfer

The data files are automatically transferred to the FTP destination (FTP server) at the following points.

- **Display data file/event data file**

  Display data/event data which acquisition is in progress

  - At intervals specified by the auto save interval for the display data or the data length for the event data.
  - At every specified date and time using the Memory Timeup function.
  - When you save the data in the internal memory to the external storage medium using the FUNC key operation.
  - When Memory Stop*1 is executed (when "Batch stop sign record"*2 is not used).
  - When Memory Stop*1 is executed and electronic signature is applied to the data file (when "Batch stop sign record"*2 is used).

    *1 Memory Stop refers to the action of stopping the data acquisition to the internal memory.

    *2 "Batch stop sign record" is used to finish the batch by applying electronic signature to the acquired data when Memory Stop is executed.

  Display data/event data which acquisition is finished

  When you load and apply electronic signature to the data file in the external storage medium using the FUNC key operation.

Note

When a file with the same name exists at the destination,

- **Display data/event data which acquisition is in progress**

  If a file with the same name exists at the destination, the name of the transferred file is changed at the last character (8th character).

  Example: An hourly report file "X0212000.DBD" is changed to "X021200A.DBD" and transferred. Characters A to Z are used in order for the last character of the file name.
- **Display data/event data which acquisition is finished**

  If a file with the same name exists at the destination, it is overwritten by the transferred file. The file in the external storage medium and the file at the destination can always be kept identical by overwriting.

- **Setup File and Setting Change Log File**

  Transferred to an FTP server when settings are changed and applied (saved to an external storage medium).

Note

If a file with the same name exists at the transfer destination, it is overwritten.

- **Report file**
  When a report is created, the DXP transfers the report data to the FTP server as a file.
- **Screen image data file**
  When Snap shot* is executed.
  * Snap shot executed using the FUNC key, User key, communication command (EV2), or via the remote control.

Note

- For the format of the report file, see appendix 2 of the DX100P/DX200P User's Manual (IM04L05A01-01E/IM04L06A01-01E).
- If a file with the same name exists at the destination, the name of the report file or screen image data file is changed at the last character (8th character) and transferred (see "Display data/event data which acquisition is in progress" in "Note" above).

Primary FTP Server and Secondary FTP Server

The DXP transfers files to the primary FTP server.
When the primary FTP server is down, the data are transferred to the secondary FTP server.

Note

If the file transfer to both primary and secondary servers fails, the DXP aborts the file transfer.

- Display data/event data files, setup/setting change log files, and report files that had failed transmission are transmitted along with the new data files when the connection with the FTP server recovers. However, the maximum number of files that can be held in the transfer waiting condition when transmission fails is a total of 20 for display data/event data files and setup/setting change log files and 50 for report files. When the number of files exceeds this number, the retransmission is cancelled from the oldest file.
- Screen image data files
  The DXP aborts screen image data files once the file transfer to both primary and secondary servers fails.

Using the Transferred Files

The following table indicates the format and the display method of the files transferred.

File/Data	Location	Extension	Format	Viewing Method
Display data file	Internal memory	DBD	Undisclosed	Viewed using DAQSIGNIN.
Event data file	Internal memory	DED	Undisclosed	Viewed using DAQSIGNIN.
Report file (A report data set)	Internal memory	DHR DDR DWR DMR	ASCII*	Viewed using commercially sold software.
Screen image data file	External	PNG	PNG format	Viewed using commercially sold software.
Setup file	External	PPL	Undisclosed	Viewed using DAQSIGNIN.
Setting change log file	External	DPL	ASCII**	Viewed using commercially sold software.

* For a description of the output format, see appendix 2 in the DX100P/DX200P User's Manual.
** For a description of the output format, see section 6.2.

2.10 Setting the Web Server Function

Explanation

To use the web server function, set the following parameters in addition to those described in section 2.3.

Enabling/Disabling the Web server function

Select Use or Not (don't use).

Page type (type of screen to be displayed)

Select [Monitor] or [Operator]. For screen examples, see section 2.11.

Monitor page

- **Selecting whether or not to use the monitor page**
  Select [On] to display the monitor page on the browser.
- **Selecting whether or not to use the access control**
  Select [On] to use the access control. You must enter the user name and password to display the monitor page.
- **Setting the user name**
  Enter the user name using up to 20 alphanumeric characters.
- **Setting the password**
  Set the password using up to eight alphanumeric characters.

Operator page

- **Selecting whether or not to use the operator page**
  Select [On] to display the operator page on the browser.
- **Selecting whether or not to use the access control**
  Select [On] to use the access control. You must enter the user name and password to display the operator page.
- **Setting the user name**
  Enter the user name using up to 20 alphanumeric characters.
- **Setting the password**
  Set the password using up to eight alphanumeric characters.

Saving the settings

To activate the settings that have been changed in the system mode, the settings must be saved. Otherwise, the settings that existed before the change are activated.

Setting the time difference from GMT

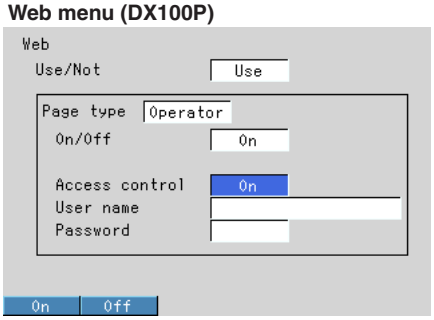
See section 4.10, "Setting the Time Zone" in the DX100P/DX200P User's Manual (IM 04L05A01-01E/IM 04L06A01-01E).

Procedure

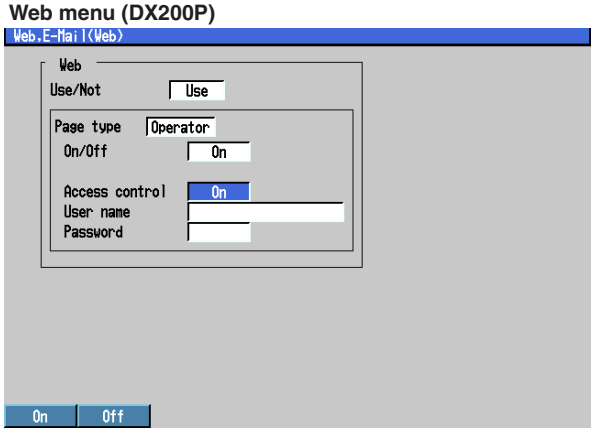
For the basic flow of operations, see “Flow of Operation using the Operation Keys” on page vi. For the procedures related to entering character strings and values, see the DX100P/DX200P User’s Manual (IM04L05A01-01E/IM04L06A01-01E).

1. Enter the system mode.
2. Press the [#9 (Web, E-Mail)](DX100P) or [#7 (Web, E-Mail)](DX200P) soft key to display the Web and e-mail setting menu.
3. Press the [#1 (Web)] soft key to display the Web menu.

Web menu (DX100P)

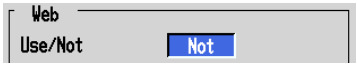


Web menu (DX200P)

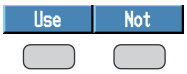


Enabling/Disabling the Web server function

4. Press the arrow key to move the cursor to the [Use/Not] box.

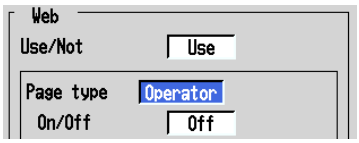


5. Press either the [Use] or [Not] soft key. If you select [Use], go to step 6. If you select [Not], go to step 25.

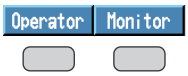


Page type (type of screen to be displayed)

6. Press the arrow key to move the cursor to the [Page type] box.



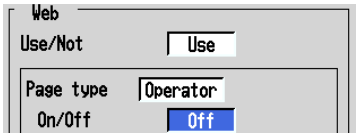
7. Press either the [Operator] or [Monitor] soft key. If you select [Operator], go to step 8. If you select [Monitor], go to step 20.



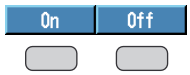
Operator page

- **Selecting whether or not to use the operator page**

8. Press the arrow key to move the cursor to the [On/Off] box.

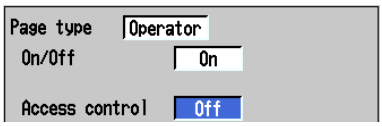


9. Press either the [On] or [Off] soft key. If you select [On], go to step 10. If you select [Off], go to step 20.

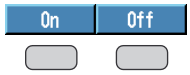


- **Selecting whether or not to use the access control**

10. Press the arrow key to move the cursor to the [Access control] box.

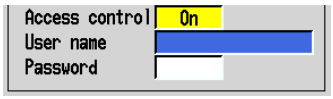


11. Press either the [On] or [Off] soft key. If you select [On], go to step 12. If you select [Off], go to step 20.



- **Setting the user name**

12. Press the arrow key to move the cursor to the [User name] box.



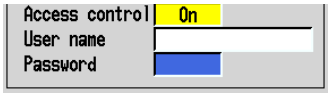
13. Press the [Input] soft key to display the entry box.

14. In the box, enter the user name.

15. Press the DISP/ENTER key. The entered string/value is set in the [User name] box.

- **Setting the password**

16. Press the arrow key to move the cursor to the [Password] box.



17. Press the [Input] soft key to display the entry box.

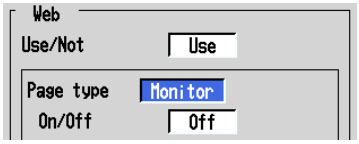
18. In the box, enter the password.

19. Press the DISP/ENTER key. The entered string/value is set in the [Password] box.

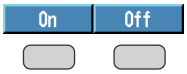
Monitor page

- **Selecting whether or not to use the monitor page**

  20. Press the arrow key to move the cursor to the [On/Off] box.



  21. Press either the [On] or [Off] soft key. If you select [On], go to step 22. If you select [Off], go to step 25.



- **Selecting whether or not to use the access control**

  22. Set whether use or not use the access control using the same method as steps 10 and 11.

- **Setting the user name**

  23. Set whether use or not use the access control using the same method from steps 12 through 15.

- **Setting the password**

  24. Set whether use or not use the access control using the same method from steps 16 through 19.

Confirming/Canceling the new settings

25. To confirm the new settings, press the DISP/ENTER key. To cancel, press the ESC key.
    For detailed operations regarding confirmation and cancellation, see “Flow of Operation using the Operation Keys” on page vi.

Storing the new settings

See “Flow of Operation using the Operation Keys” on page vi.

2.11 Using the Web Server

Required Settings

Follow the procedures below to use the Web server function.

- Section 2.3, “Configuring the Ethernet Interface”
- Section 2.10, “Setting the Web Server Function”

Explanation

This section describes how to display the monitor page and operator page and the operation on each page.

Browser application that can be used

Operations have been confirmed on the following browsers.
Microsoft Internet Explorer 4.0 to 6.0

Setting the URL

Set the URL (Uniform Resource Locator) appropriately according to the network environment that you are using. You can access the DXP by setting the URL as follows:

- **http://host name.domain name/file name**
- http: Protocol used to access the server. HTTP (HyperText Transfer Protocol).
  - Host name.domain name: Host name and domain name of the DXP. You can also use the IP address in place of the host name and domain name.
  - File name: File name of the monitor page and operator page of the DXP.
    File name of the monitor page: **monitor.htm**
    File name of the operator page: **operator.htm**
    If the file name is left out, the monitor page is specified. If the monitor page is not used, however, the operator page is specified.

Example

To display the operator page using Internet Explorer on a PC in the same domain as the DXP (the domain name, host name, and IP address are taken to be “good.co.jp,” “DXP,” “and 123.456.789.123,” respectively).

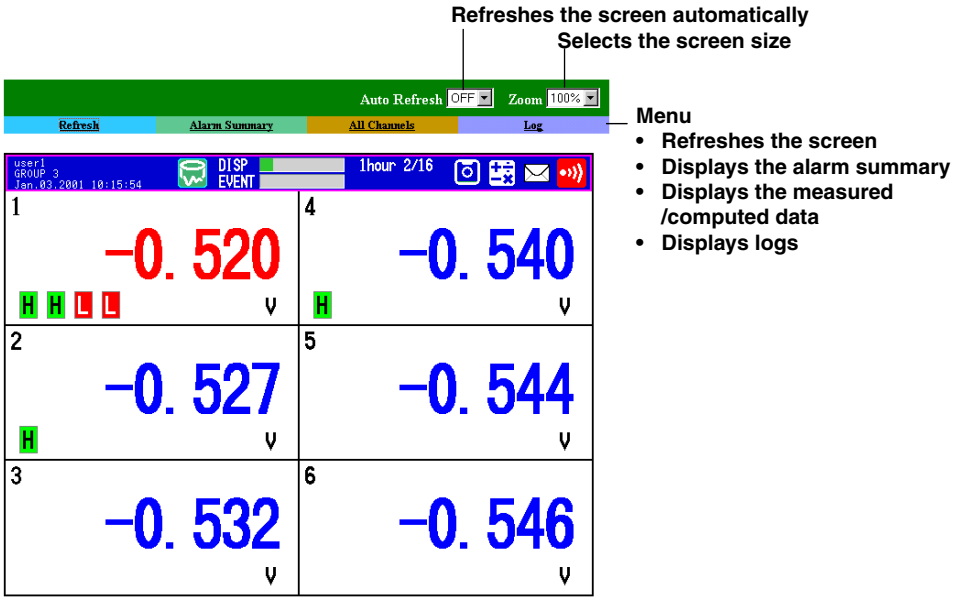
Address: **http://DXP.good.co.jp/operator.htm** or
Address: **http://123.456.789.123/operator.htm**

Display

When the DXP is in the engineering mode* or system mode*, the monitor page cannot be displayed. An error message is displayed.

* For details on the engineering mode and system mode, see the DX100P/DX200P User’s Manual (IM04L05A01-01E/IM04L06A01-01E).

Contents on the monitor page



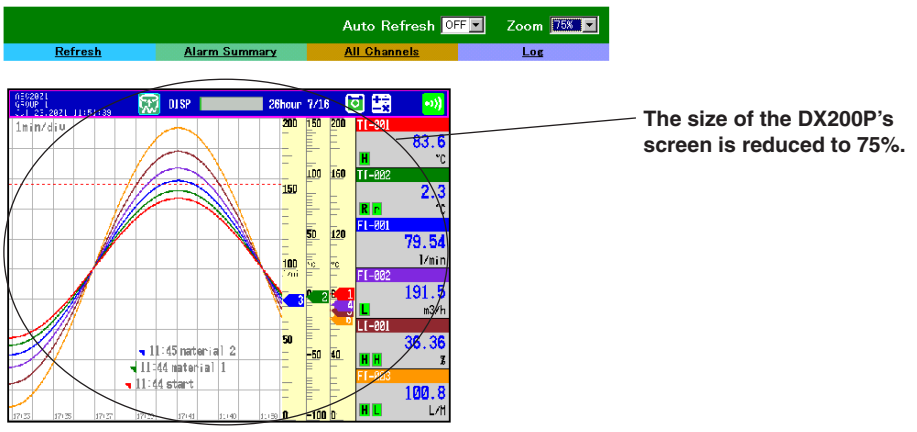
- **Screen displayed by the DXP**
  When the DXP is in the operation mode, the screen displayed on the DXP (trend, digital, bar graph, and other screens) is displayed on the monitor page.

Note

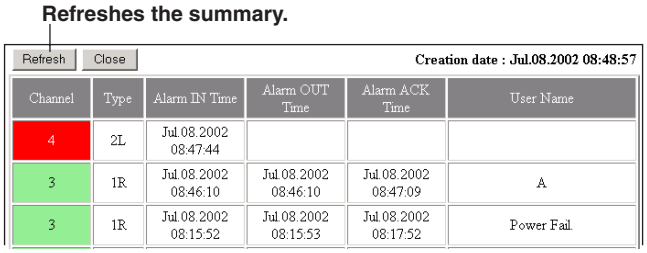
A character "°" that is set on the DXP is displayed as a character "^" on the Web browser.

- **Refreshing the monitor page**
  The monitor page can be refreshed automatically or manually.
  - **Auto refresh ON**
    The monitor page is refreshed at a refresh rate of approximately 30 s.
  - **Auto refresh OFF**
    Monitor page is not automatically refreshed. You can refresh the page manually. However, the page cannot be refreshed in approximately 30 seconds after the page refreshment.

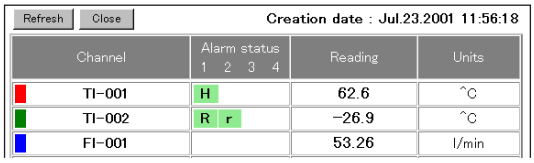
- **Zooming in or out of the screen**
  The DXP screen that is displayed on the monitor page can be reduced to 75% in size (DX200P) or expanded to 200% (DX100P).



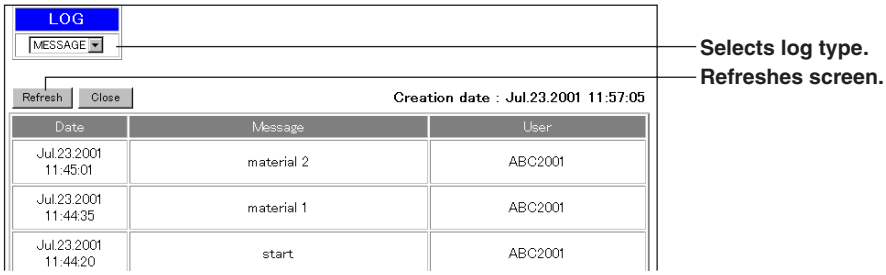
- **Displaying the alarm summary**
  Displays the alarm summary. Click Refresh to refresh the data.



- **Displaying measured/computed data**
  Displays the measured/computed data of all channels (excludes measurement channels set to skip and computation channels set to Off). Click Refresh to refresh the data.



- **Displaying the log**
  Displays the message log, error log, FTP log, Web operation log, e-mail log, setting change log, and SNTP log. Click Refresh to refresh the data.
  An example of the log (message log)



Contents of the operator page

See a display example in section 1.1. On the operator page, the following operations can be carried out in addition to the information available on the monitor page.

- **Operations using the DISP/ENTER key and arrow keys**
  You can use the DISP/ENTER key and arrow keys on the operator page to carry out the same operations as the DISP/ENTER key and arrow keys on the DXP. However, Alarm ACK operation cannot be performed on individual alarms on the overview display.
- **Switching trend, digital, and bar graph displays**
  Switch the screen on the DXP by specifying the group that will display the trend, numerical, or bar graph display.

Using the Monitor Page

This section gives an overview of the operations. Follow the operating procedures on your PC.

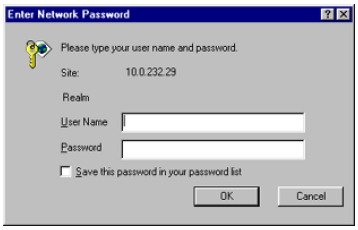
Procedure

1. Start the browser and open the monitor page of the DXP. If access control is specified, proceed to step 2. Otherwise, proceed to step 5.

Entering the user name and password

- **Entering the user name**

2. A window appears for you to enter the user name and password. Enter the user name.



- **Entering the password**

3. Enter the password. All characters are displayed as asterisks (*).
   If the [Save the password] check box is selected, the window appears with the saved password the next time (all characters are displayed as asterisks (*)).

4. Click [OK] to display the monitor page.

Auto refreshing the display

Click [Auto Refresh] to specify [ON] or [OFF].

Refreshing the display manually

Click [Refresh] in the display menu section to refresh the page.

Zooming in or out of the display

Click [Zoom] to specify 100% or 75% (DX200P), or 100% or 200% (DX100P).

Displaying the alarm summary

Click [Alarm summary] in the display menu section to display the alarm summary.
Click [Refresh] to refresh the alarm summary information.
Click [Close] to close the alarm summary window.

Displaying measured/computed data

Click [All channels] in the display menu section to display the measured/computed data.
Click [Refresh] to refresh the measured/computed data.
Click [Close] to close the measured/computed data window.

Displaying the log

Click [Log] in the display menu section to display the log.
Click the box used to select the log type. The selected type of log is displayed.
Click [Refresh] to refresh the log information.
Click [Close] to close the log window.

Using the Operator Page

This section gives an overview of the operations. Follow the operating procedures on your PC.

Procedure

Start the browser and open the operator page of the DXP.

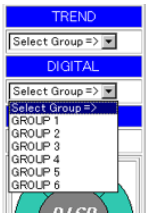
The following operations are the same as the monitor page. See “Using the Monitor Page.”

- **Entering the user name and password**
- **Auto refreshing the display**
- **Refreshing the display manually**
- **Zooming in or out of the display**
- **Displaying the alarm summary**
- **Displaying measured/computed data**
- **Displaying the log**

The followings are the operations only on the operator page.

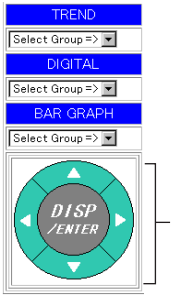
Switching trend, digital, and bar graph displays

Click [Select group] of the trend, digital, or bar graph display in the display switch section to select the group. The DXP screen changes to the specified display. The operator page is also refreshed.



Operating using the DISP/ENTER key and arrow keys

Click the [DISP/ENTER] key or arrow keys that are displayed on the operator page to operate the DXP in the same fashion as the corresponding keys on the DXP. The operator page is also refreshed.



The DISP/ENTER key and arrow keys

Note

The two operations described above cannot be performed in the following cases.

- If there is a user logged in using the keys on the DXP or there is a user who started the login operation.
- When there is a user logged into the DXP setting function via communications
  However, if the DXP is configured to allow screen switching when logged out (see section 4.4 in the DX100P/DX200P User's Manual for the setup procedure), the operation is possible even when there is a user logged in to the DXP setting function via communications.

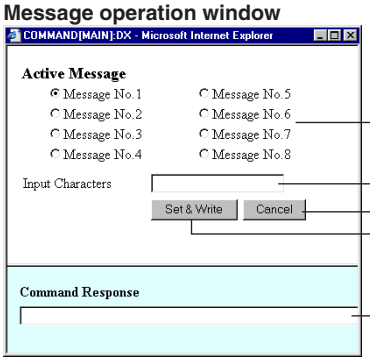
Note

If the DXP is configured not to use the login function (no administrators are registered), free messages can be written and alarm ACK operation can be performed on individual alarms on the operator page.

- **Writing free messages (only when not using the login function)**
  When the login function is not being used, the [Message] button appears in the display menu section. Click [Message] to open the message operation window.
  Select the free message number, enter the message string using the keyboard, and click [Set&Write]. The message will be written.

[Message] button

Message operation window



Selects message.
Enters message.
Cancels message entered.
Sets and write message.
Displays the response from the DXP

- **Performing alarm ACK operation on individual alarms (only when not using the login function)**
  Individual alarms can be acknowledged on the overview screen in the same manner as the key operation on the DXP.

2.12 Setting the E-Mail Transmission Function

Explanation

To use the e-mail transmission function, set the following parameters in addition to those described in section 2.3.

Basic settings of e-mail

- **SMTP* server name**
  Set the SMTP server name or IP address of the SMTP server using up to 64 alphanumeric characters.
  * Simple Mail Transfer Protocol
- **Port number**
  Set the port number to use. The default value is 25.
- **Recipient 1**
  Set the transmission destination of the e-mail message using up to 150 alphanumeric characters. You can specify multiple addresses. To specify multiple addresses, delimit the addresses using spaces.
- **Recipient 2**
  Set the transmission destination of the e-mail message using up to 150 alphanumeric characters. You can specify multiple addresses. To specify multiple addresses, delimit the addresses using spaces.
- **Sender**
  Set the e-mail address using up to 64 alphanumeric characters. If the address is not set, the first address set in the recipient box is used as the sender's address instead.

Settings for transmitting alarm information

- **Recipient 1, Recipient 2**
  Turns On (transmits e-mail messages to the recipient) or Off (does not transmit e-mail messages to the recipient) for each recipient.
- **Alarm number of which the alarm information is to be transmitted via the e-mail message (alarm 1, alarm 2, alarm 3, and alarm 4)**
  You can turn On/Off the function for each alarm number. This setting is common to all channels.
  - **On**
    If any one of the alarms corresponding to the relevant alarm number on all channels changes (alarm occurrence or release), an e-mail message is transmitted.
  - **Off**
    The alarm information of the alarm number is not transmitted.
- **Contents of the transmitted mail**
  - **Add instantaneous values**
    - **On**
      Adds to the e-mail message the instantaneous values of all channels existing at the time when the alarm condition changed.
    - **Off**
      The instantaneous values are not added to the e-mail message.

- **Add sender URL (Uniform Resource Locator)**
  - **On**
    If the Web server function is specified on the DXP, the URL of the DXP is attached to the e-mail.
  - **Off**
    The URL of the DXP is not attached to the e-mail.
- **Subject**
  Set the subject of the e-mail message using up to 32 alphanumeric characters. The default value is "(DX)Alarm_summary."
- **Header1**
  Set the string to be attached to the e-mail message using up to 64 alphanumeric characters.
- **Header2**
  Set the string to be attached to the e-mail message using up to 64 alphanumeric characters.

Settings when transmitting e-mail messages at the specified time

- **Recipient 1, Recipient 2**
  Turn On/Off for each recipient.
  - **On**
    Transmits e-mail messages to the recipient.
  - **Off**
    Does not transmit e-mail messages to the recipient.
- **Interval**
  Time interval used to repeat the e-mail transmission starting from the Ref. Time. Select from the following list of choices for each recipient.
  1h, 2h, 3h, 4h, 6h, 8h, 12h, and 24h
- **Ref. Time**
  Specify the time when the e-mail message is transmitted in the following range for each recipient. The e-mail transmission is repeated every Interval from this point.
  00:00 to 23:59
  Example: If Ref. Time is 17:15 and Interval is 8h, e-mail messages are transmitted at 17:15, 01:15, and 09:15.
- **Contents of the transmitted mail**
  See "Contents of the transmitted mail" on the previous page. The default value for [Subject] is "(DX)Periodic_data."

Settings when transmitting e-mail messages at the time of recovery from a power failure (System E-Mail settings).

For the transmitted contents of the system mail, see section 1.1.

- **Recipient 1, Recipient 2**
  Turn On/Off for each recipient.
  - **On**
    Transmits e-mail messages to the recipient.
  - **Off**
    Does not transmit e-mail messages to the recipient.
- **Contents of the transmitted mail**
  See "Contents of the transmitted mail" on the previous page. The instantaneous values of all channels are not to be added. The default value for [Subject] is "(DX)System_warning."

Settings when transmitting e-mail messages at the time of report creation (for models with the computation function /M1)

- **Recipient 1, Recipient 2**
  Turn On/Off for each recipient.
  - **On**
    Transmits e-mail messages to the recipient.
  - **Off**
    Does not transmit e-mail messages to the recipient.
- **Contents of the transmitted mail**
  See “Contents of the transmitted mail” on page 2-38. The instantaneous values of all channels are not to be added. The default value for [Subject] is “(DX)Report_data.”

Saving the settings

To activate the settings that have been changed in the system mode, the settings must be saved. Otherwise, the settings that existed before the change are activated.

Procedure

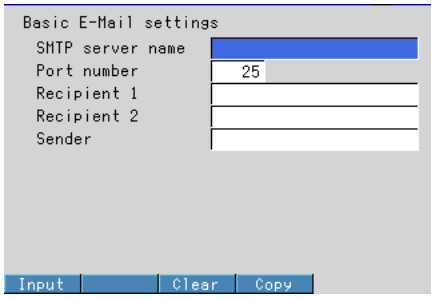
For the basic flow of operations, see “Flow of Operation using the Operation Keys” on page vi. For the procedures related to entering character strings and values, see the DX100P/DX200P User’s Manual (IM04L05A01-01E/IM04L06A01-01E).

1. Enter the system mode.
2. Press the [#9 (Web,E-Mail)](DX100P) or [#7 (Web, E-Mail)](DX200P) soft key to display the Web and e-mail setting menu.

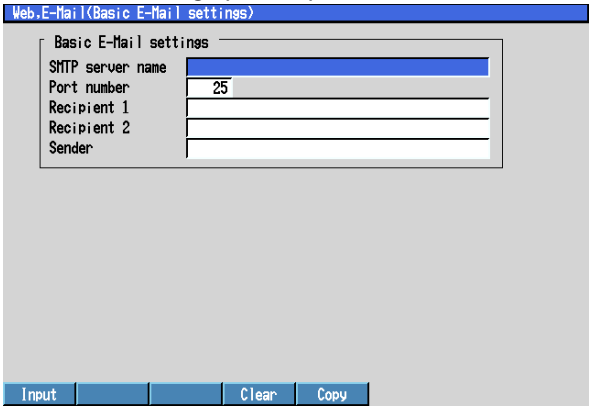
Basic settings of e-mail

3. Press the [#2 (Basic E-Mail settings)] soft key to display the Web menu.

Basic E-Mail settings (DX100P)

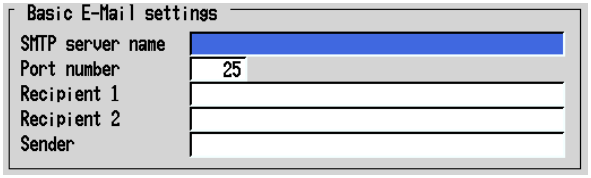


Basic E-Mail settings (DX200P)



- **SMTP* server name**

4. Press the arrow key to move the cursor to the [SMTP server name] box.



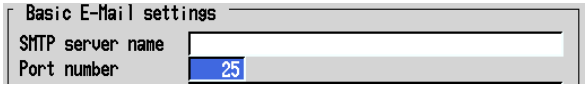
5. Press the [Input] soft key to display the entry box.

6. In the box, enter the SMTP server name.

7. Press the DISP/ENTER key. The entered string/value is set in the [SMTP server name] box.

- **Port number**

8. Press the arrow key to move the cursor to the [Port number] box.



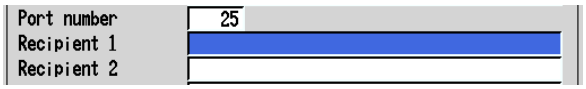
9. Press the [Input] soft key to display the entry box.

10. In the box, enter the port number.

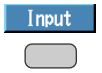
11. Press the DISP/ENTER key. The entered string/value is set in the [Port number] box.

- **Recipient 1**

12. Press the arrow key to move the cursor to the [Recipient 1] box.



13. Press the [Input] soft key to display the entry box.



14. In the box, enter the address of the recipient 1.

15. Press the DISP/ENTER key. The entered string/value is set in the [Recipient 1] box.

- **Recipient 2**

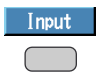
16. Press the arrow key to move the cursor to the [Recipient 2] box.

17. Set the address of the recipient 2 using the same method as setting the address of the recipient 1.

- **Sender**

18. Press the arrow key to move the cursor to the [Sender] box.

19. Press the [Input] soft key to display the entry box.



20. In the box, enter the address of the sender.

21. Press the DISP/ENTER key. The entered string/value is set in the [Sender] box.

Confirming/Canceling the new settings

22. To confirm the new settings, press the DISP/ENTER key. To cancel, press the ESC key.
    For detailed operations regarding confirmation and cancellation, see “Flow of Operation using the Operation Keys” on page vi.

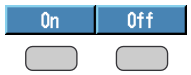
[Alarm E-Mail], [Scheduled E-Mail], [System E-Mail], [Report E-Mail]

23. Press the ESC key to display the Web, e-mail setting menu. Press the soft key to display the setting menu to be set.
    [Alarm E-Mail]: Go to step 24.
    [Scheduled E-Mail]: Go to step 41.
    [System E-Mail]: Go to step 53.
    [Report E-Mail]: Go to step 58.

- **[Alarm E-Mail]**
  - **Recipient 1, Recipient 2**

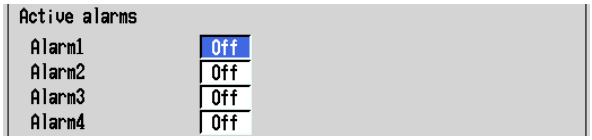
24. Press the arrow key to move the cursor to the [Recipient 1] box or the [Recipient 2] box.

25. Press either the [On] or [Off] soft key.

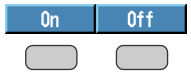


  - **Alarm number of which the alarm information is to be transmitted via the e-mail message**

26. Press the arrow key to move the cursor to one of the [Alarm 1] through [Alarm 4] boxes.

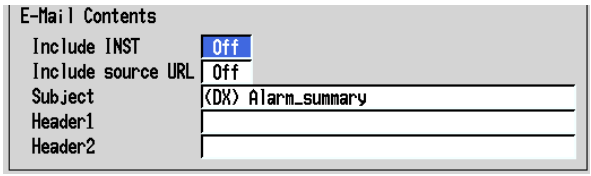


27. Press either the [On] or [Off] soft key.

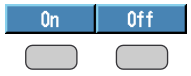


  - **Add instantaneous values**

28. Press the arrow key to move the cursor to the [Include instantaneous value] (DX100P) or [Include INST] (DX200P) box.



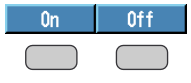
29. Press either the [On] or [Off] soft key.



  - **Add sender URL (Uniform Resource Locator)**

30. Press the arrow key to move the cursor to the [Include source URL] box.

31. Press either the [On] or [Off] soft key.



- **Subject**

32. Press the arrow key to move the cursor to the [Subject] box.

33. Press the [Input] soft key to display the entry box.

34. In the box, enter the subject.

35. Press the DISP/ENTER key. The entered string/value is set in the [Subject] box.

- **Header**

36. Press the arrow key to move the cursor to either the [Header 1] box or the [Header 2] box.

37. Press the [Input] soft key to display the entry box.

38. In the box, enter the character strings.

39. Press the DISP/ENTER key. The entered string/value is set in the [Header] box.

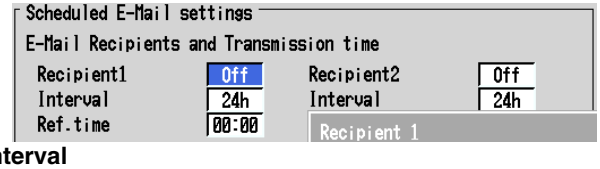
Confirming/Canceling the new settings

40. To confirm the new settings, press the DISP/ENTER key. To cancel, press the ESC key.
    For detailed operations regarding confirmation and cancellation, see “Flow of Operation using the Operation Keys” on page vi.

- **[Scheduled E-Mail]**

  - **Recipient 1, Recipient 2**

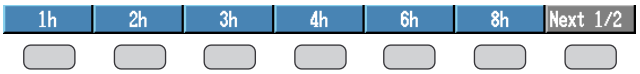
41. Set the address of the recipient 1 and 2 using the same method as steps 24 and 25.



  - **Interval**

42. Press the arrow key to move the cursor to the [Interval] box.

43. Press one of the soft keys from [1h] to [24h] to select the interval.



- **Ref. Time**

44. Press the arrow key to move the cursor to the [Ref. Time] box.

45. Press the [Input] soft key to display the entry box.

46. In the box, enter the reference time.

47. Press the DISP/ENTER key. The entered string/value is set in the [Ref. Time] box.

- **Add instantaneous values**

48. Set whether add or not the instantaneous values to the e-mail message using the same method as steps 28 and 29.

- **Add sender URL (Uniform Resource Locator)**

49. Set whether add or not the sender URL to the e-mail message using the same method as steps 30 and 31.

- **Subject**

50. Set the subject using the same method from steps 32 through 35.

- **Header**

51. Set the header using the same method from steps 36 through 39.

Confirming/Canceling the new settings

52. To confirm the new settings, press the DISP/ENTER key. To cancel, press the ESC key.
    For detailed operations regarding confirmation and cancellation, see “Flow of Operation using the Operation Keys” on page vi.

- **[System E-Mail]**
  - **Recipient 1, Recipient 2**

53. Set the address of the recipient 1 and 2 using the same method as steps 24 and 25.

  - **Add sender URL (Uniform Resource Locator)**

54. Set whether add or not the sender URL to the e-mail message using the same method as steps 30 and 31.

  - **Subject**

55. Set the subject using the same method from steps 32 through 35.

  - **Header**

56. Set the header using the same method from steps 36 through 39.

Confirming/Canceling the new settings

57. To confirm the new settings, press the DISP/ENTER key. To cancel, press the ESC key.
    For detailed operations regarding confirmation and cancellation, see “Flow of Operation using the Operation Keys” on page vi.

- **[Report E-Mail]**
  - **Recipient 1, Recipient 2**

58. Set the address of the recipient 1 and 2 using the same method as steps 24 and 25.

- **Add sender URL (Uniform Resource Locator)**

59. Set whether add or not the sender URL to the e-mail message using the same method as steps 30 and 31.

- **Subject**

60. Set the subject using the same method from steps 32 through 35.

- **Header**

61. Set the header using the same method from steps 36 through 39.

Confirming/Canceling the new settings

62. To confirm the new settings, press the DISP/ENTER key. To cancel, press the ESC key.
    For detailed operations regarding confirmation and cancellation, see “Flow of Operation using the Operation Keys” on page vi.

Storing the new settings

See “Flow of Operation using the Operation Keys” on page vi.

2.13 Using the E-Mail Transmission Function

Required Settings

Follow the procedures below to use the e-mail transmission function.

- Section 2.3, “Configuring the Ethernet Interface”
- Section 2.12, “Setting the E-Mail Transmission Function”

Performing an E-Mail Transmission Test

Explanation

You can transmit a test e-mail message to recipient 1 or recipient 2 that you specified in section 2.12 to confirm whether or not e-mail messages can be transmitted.

Items to check before performing this test

- Connect the Ethernet cable correctly. For the connection procedure, see section 2.2.
- Check that the Ethernet interface settings are correct. For the procedure, see section 2.3.
- Check that the e-mail settings are correct. For the procedure, see section 2.12.

When setting the Ethernet interface or e-mail, check the settings with your system or network administrator.

Checking the results of the e-mail transmission test

- The result of the e-mail transmission test can be confirmed by displaying the e-mail log (displayed on the DXP (see section 8.9 of the DX100P/DX200P User’s Manual)) or Web screen (see section 2.11) or by outputting the logs using the FL command (see section 2.7).
- If an error message is displayed on the DXP, see appendix 6, “A List of Error Messages.”

Contents of the test e-mail message

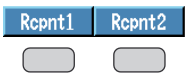
The figure below shows the contents of the test e-mail message.

```
From: DX@good.co.jp
Date: Sat, 23 Dec 2000 07:25:20 +0900 (JST)
Subject: (DX) Test_mail
To: user1@good.co.jp

Test mail.
<Host name>
DX

<Time>
Dec.23 07:25:20
```

Procedure

1. Press the FUNC key. The FUNC menu appears. The structure of the FUNC menu varies depending on the basic settings and options.
2. Press the E-Mail test soft key. A menu appears for you to select the recipient for the e-mail transmission test.

3. Press the Recipient 1 or Recipient 2 soft key. The e-mail transmission test is executed for the selected recipient.



Starting/Stopping E-Mail Transmissions

Explanation

Starting/Stopping e-mail transmissions

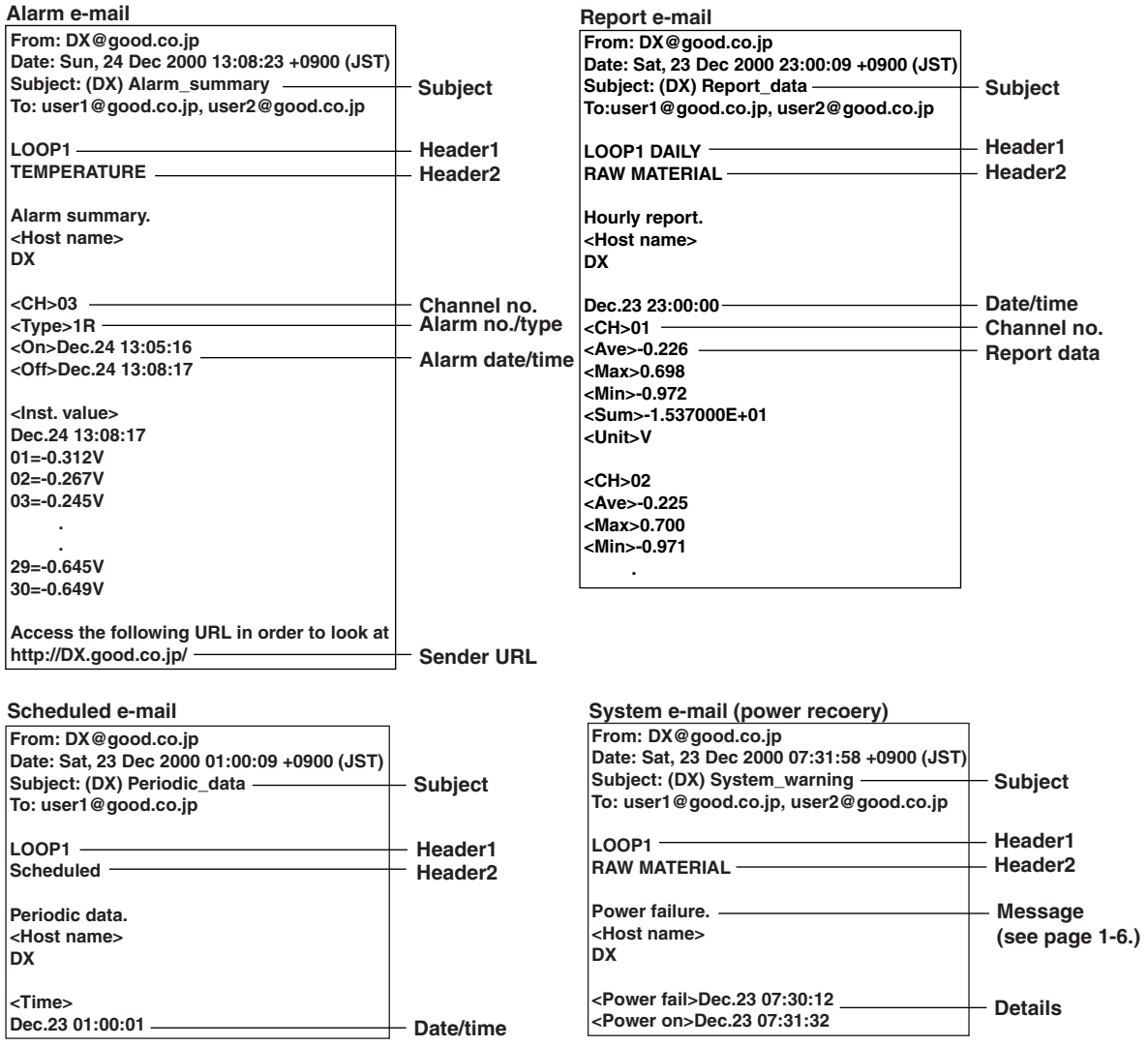
- If the e-mail transmission is started, the e-mail transmission function is activated.
- If the e-mail transmission is stopped, the e-mail transmission function is disabled. The e-mail messages that have not been transmitted are cleared.

Note

- If the DXP enters the system mode while the e-mail transmission is started, the e-mail transmission is stopped. If the DXP returns to the operation mode from the system mode, the condition that existed before entering the system mode is resumed.
- If a e-mail transmission fails, the DXP retransmits the e-mail twice at intervals of 30 seconds. If all of the transmission fail, the mail is discarded.

Contents of the e-mail message

The figure below shows an example of an e-mail message.



Procedure

Starting the e-mail transmission

1. Press the FUNC key. The FUNC menu appears. The structure of the FUNC menu varies depending on the basic settings and options. If Next is displayed as a choice, this indicates that there are multiple lines of choices. Press the Next soft key to display the menu with the E-Mail start item.
2. Press the E-mail start soft key. E-mail transmission is started. An e-mail transmission function icon ( ) is displayed in the status display section of the DXP.

Stopping the e-mail transmission

1. Press the FUNC key. The FUNC menu appears. The structure of the FUNC menu varies depending on the basic settings and options. If Next is displayed as a choice, this indicates that there are multiple lines of choices. Press the Next soft key to display the menu with the E-Mail stop item.
2. Press the E-mail stop soft key. E-mail transmission is stopped. The e-mail transmission function icon disappears from the status display section of the DXP.

Note

The [E-Mail START] and [E-Mail STOP] soft keys are displayed on the FUNC key menu when the [Recipient1] or [Recipient2] for alarm, scheduled, system, or report e-mails is set to [ON].

2.14 Using the Maintenance/Test Server

Required Settings

Follow the procedures below to use the maintenance/test server function.

- Section 2.3, “Configuring the Ethernet Interface”
- Section 2.6, “Setting Timeout/Keep Alive and the User That Is to Use the Communication Input Data”

Logging In

Explanation

Carry out the steps according to the PC, software, and network environment that you are using.
For a description of the procedures on the PC up to the step for logging into the DXP and the responses from the DXP, see “Using the Setting/Measurement Server” in section 2.7.
For a description of the flow of the login process, see appendix 4.

Login Conditions

Users that are registered in the DXP and are allowed to log in via communications can log into the setting function or monitor function.

- Only administrators can log into the setting function.
- An administrator or a user can log into the monitor function.
- Only a single user can log in at any given time.

Note

If you select a function (setting or monitor) when connecting to the DXP from the PC with no administrators registered, the DXP returns “E0” and is immediately ready to receive commands.

- If you select the setting function, it is equivalent to logging into the setting function at the administrator level. This is also true if you enter “admin” in place of “setting.”
- If you select the monitor function, it is equivalent to logging into the monitor function at the user level. This is also true if you enter “user” in place of “monitor.”

Error Messages

See “Using the Setting/Measurement Server” in section 2.7.

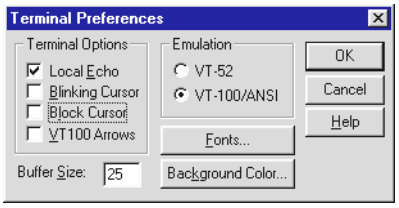
Procedure

The operating procedures on Windows Telnet are shown below.

When using Windows 98

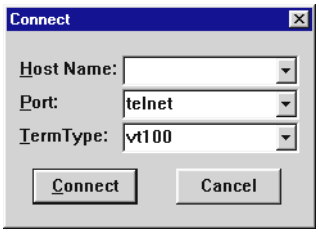
1. Start the Telnet application that comes with Windows 98.
2. Select [Terminal] - [Preferences] from the menu bar.
   The [Terminal Preferences] dialog box opens.

3. Set the parameters as shown below and click [OK].
   Terminal Options
   Local Echo: ON
   Others: OFF
   Emulation: VT-100/ANSI



4. Select [Connect] - [Remote System] from the men bar.
   The [Connect] dialog box opens.

5. Set the parameters as shown below and click [Connect].
   Host Name: DXP's IP address or the host name
   Port: 34261
   Term Type: vt100



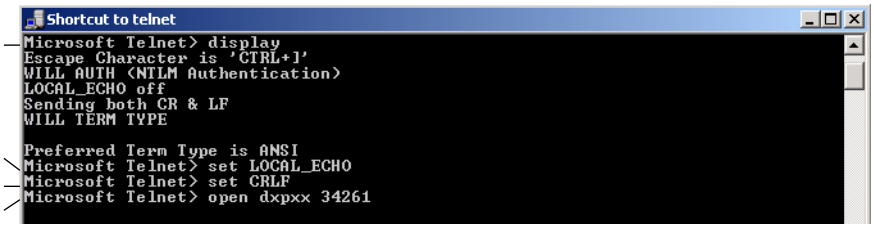
   The DXP returns the following message.
   E1 402 "Select function from 'setting' or 'monitor'."

For the operating procedures, see "Logging In" in section 2.7 (page 2-19).

When using Windows 2000

1. Start the Telnet application that comes with Windows 2000.
2. Enter [display ?]. The operation parameters are shown.
3. Set the parameters as shown below using the "set" command (see the figure below).
   Turn ON the Local Echo.
   `set LOCAL_ECHO`
   Send both CR and LF.
   `set CRLF`
4. Connect to the DXP using "open" command.
   `open` "IP address or the host name of the DXP" "34261"
   * Put a space between "IP address or the host name of the DXP" and "34261."
   "34261" is the port number of the maintenance/test server.

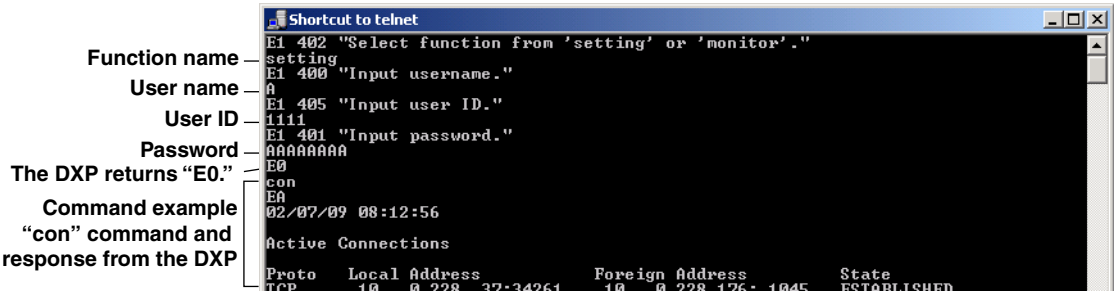
Displays operating parameters.
Turns ON Local Echo.
Sends both CR and LF.
Connects to the DXP.



The DXP returns the following message.
E1 402 "Select function from 'setting' or 'monitor'."

For the operating procedures, see "Logging In" in section 2.7 (page 2-19). Also see the display example on next page.

Display example



Sending Commands

Dedicated commands for the DXP are used.

Commands That Can Be Used

- **When logged into the setting function**

Parameter	Description	Ref. sections
close	Disconnects the connection between other devices	5.9
con	Outputs connection information	
eth	Outputs Ethernet statistical information	
help	Outputs help	
net	Outputs network statistical information	
quit	Disconnects the connection of the device being operated	

- **When logged into the monitor function**
  All commands except the close command can be used.

Disconnecting from the DXP (Logging Out)

You are logged out in the following cases.

- **Log out by sending a command**
  Send the quit command.
- **Log out according to the communication timeout**
  The connection with a client is automatically dropped if there is no data transmission for 15 minutes.
- **When a communication error occurs**
  When a transmission error, reception error, or timeout of the keep alive function (see “Setting/Measurement Server” in section 1.1) occurs, you are logged out.

2.15 Using the Instrument Information Server

Required Settings

Follow the procedures below to use the instrument information server function.

- Section 2.3, “Configuring the Ethernet Interface”

Specifications

The instrument information server function interprets one UDP packet to be one command and returns a single packet (containing the DXP’s information) in response to the command.

Item	Specifications
Port number	34264/udp (see section 2.1)
Transfer data	ASCII
Received buffer length	128
Transmit buffer length	512
Maximum number of parameters	32

Command

In the command packet, parameters corresponding to the desired information are placed one after another. These are the commands for the test server.

Parameter	Description
all	Outputs all information that is output using the parameters below (serial, model, host, ip).
serial	Outputs the serial number.
model	Outputs the manufacturer, model, and firmware version.
host	Outputs the host name (the host name specified in section 2.3).
ip	Outputs the IP address (the IP address specified in section 2.3).

Example

Query the IP address and host name. (Of the two frames below, the top frame represents the command packet, the bottom frame represents e response packet.)

```
ip host
```

```
EA
ip = 192.168.111.24
host = DX200P-1
EN
```

Description

- Separate each parameter with one or more blanks (space, tab, carriage return, line feed).
- Parameters are not case sensitive.
- Undefined parameters will be ignored.
- Parameters beyond the 32nd parameter are ignored.

Response

The parameters of the packet that are returned as a response are lined up according to the following format.

Note

The *"CRLF"* used in this section denotes carriage return line feed.

EA*CRLF*
(Parameter 1)_=_(value of parameter 1)*CRLF*
(Parameter 2)_=_(value of parameter 2)*CRLF*
.....
EN*CRLF*

- The parameter values are output in the order specified by the command parameter.
- The output order of the parameters when "all" is specified is not constant.
- Even if the same parameters are specified numerous times, only the first occurrence is output.
- Lower-case characters are used for the parameters.
- "_" indicates a space.

Output Example

Several output examples are indicated below.

Packet Parameter Sent as Commands	Response
The "all" parameter can be used to output all information for parameters serial, model, host, and ip.	
all	EA serial = 12V636848 model = YOKOGAWA,DX200P,1.01 host = DX200P-1 ip = 192.168.111.24 EN
Parameters are not case sensitive.	
ip HoSt	EA ip = 192.168.111.24 host = DX200P-1 EN
Even if the same parameters are specified numerous times, only the first occurrence is output.	
host ip host ip host model	EA host = DX200-1 ip = 192.168.111.24 model = YOKOGAWA,DX200P,1.01 EN
Undefined parameters are ignored.	
(Space)	EA EN

2.16 Setting the SNTP Server Function or SNTP Client Function

Explanation

The DXP can operate as an SNTP server or an SNTP client on the Ethernet network. To use this function, however, the Ethernet interface must be configured as described in section 2.3.

Setting the SNTP Server Function

- **Server settings Use/Not**
  Sets whether to use the SNTP server function.

Setting the SNTP Client Function

- **Client settings Use/Not**
  Sets whether to use the SNTP client function.
- **Server name**
  Set the access destination of time information using up to 64 alphanumeric characters.
  - If the DNS is used, you can set the server host name as a server name. For details on setting the DNS, see section 2.3.
  - You can also set the IP address. In this case, the DNS is not required.
- **Port number**
  Set the port number of the SNTP server in the range from 1 to 65535. The default value is 123.
- **Access interval**
  Select the time interval for accessing the time on the SNTP server from [Off], [1h], [8h], [12h], or [24h]. Time is not queried if [Off] is selected.
- **Access reference time**
  The time used as a reference for the time query. The time is queried at the specified access interval with respect to this time.
  Set the time in the range of 00:00 to 23:59.
- **Access timeout**
  The timeout period for a response from the SNTP server. If no response is received within this time period, time query will not be performed.
  Select [10s], [30s], or [90s].
- **SNTP synched to start Time adjust on Start action**
  Set whether to query the time using the SNTP client function (On/Off) when data acquisition is started.

Saving the settings

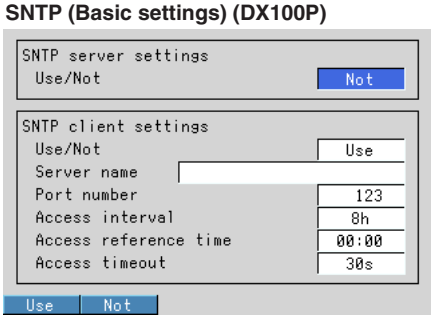
To activate the settings that have been changed in the system mode, the settings must be saved. Otherwise, the settings that existed before the change are activated.

Procedure

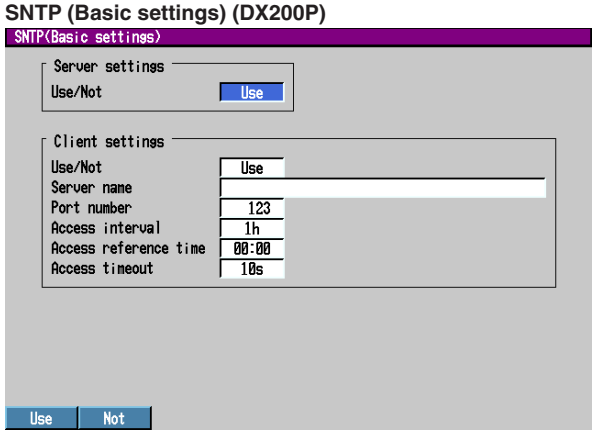
For the basic flow of operations, see “Flow of Operation using the Operation Keys” on page vi. For the procedures related to entering character strings and values, see the DX100P/DX200P User's Manual (IM04L05A01-01E/IM04L06A01-01E).

1. Enter the system mode.
2. Press the [#12 (SNTP)] (DX100P) or [#10 (SNTP)] (DX200P) soft key to display the SNTP setting menu.
3. Press the [#1 (Basic settings)] soft key. The SNTP (Basic settings) menu appears.

SNTP (Basic settings) (DX100P)

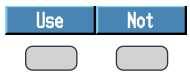


SNTP (Basic settings) (DX200P)



Setting the SNTP server function

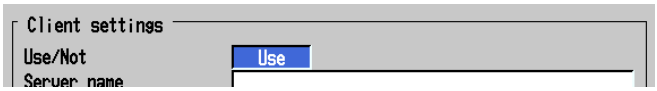
4. Press the arrow key to move the cursor to the [Server settings Use/Not] box.
5. Press the [Use] or [Not] soft key.



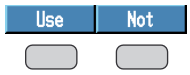
This completes the setting of the SNTP server function.

Setting the SNTP client function

6. Press the arrow key to move the cursor to the [Client settings Use/Not] box.



7. Press the [Use] or [Not] soft key. If you selected [Use] proceed to step 8; if you selected [Not] proceed to step 28.



- **Setting the server name**

8. Press the arrow key to move the cursor to the [Server name] box.

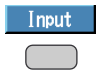
9. Press the [Input] soft key to display the entry box.

10. In the entry box, enter the server host name or IP address.
11. Press the DISP/ENTER key. The entered string/value is set in the [Server name] box.

- **Setting the port number**

12. Press the arrow key to move the cursor to the [Port number] box.

13. Press the [Input] soft key to display the entry box.



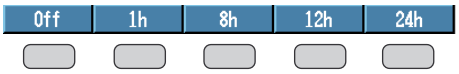
14. In the entry box, enter the port number of the SNTP server.

15. Press the DISP/ENTER key. The entered string/value is set in the [Port number] box.

- **Setting the access interval**

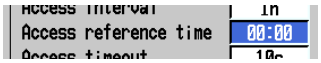
16. Press the arrow key to move the cursor to the [Access interval] box.

17. Press the [Off], [1h], [8h], [12h], or [24h] soft key.

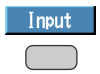


- **Setting the access reference time**

18. Press the arrow key to move the cursor to the [Access reference time] box.



19. Press the [Input] soft key to display the entry box.

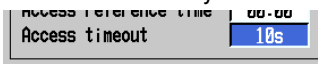


20. In the entry box, enter the starting point of the time queries.

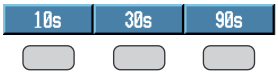
21. Press the DISP/ENTER key. The entered time is set in the [Access reference time] box.

- **Setting the access timeout**

22. Press the arrow key to move the cursor to the [Access timeout] box.



23. Press the [10s], [30s], or [90s] soft key.

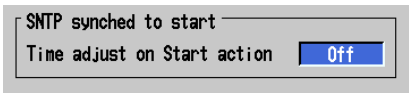


24. Press the DISP/ENTER key. The setting is entered.

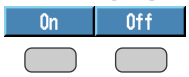
- **Setting the time adjustment that is performed while data acquisition is in progress**

  25. Press the ESC key to return to the SNTP setting menu.

  26. Press the [#2 (SNTP synched to start)] soft key to display the SNTP synched to start menu.



  27. Press the [On] or [Off] soft key to set the [Time adjust on Start action] box.



Confirming/Canceling the new settings

28. To confirm the new settings, press the DISP/ENTER key. To cancel the settings, press the ESC key.
    For detailed operations regarding confirmation and cancellation, see “Flow of Operation using the Operation Keys” on page vi.

Storing the new settings

See “Flow of Operation using the Operation Keys” on page vi.

2.17 Using the SNTP Server Function or SNTP Client Function

Required Settings

Follow the procedures below to use the SNTP server function or SNTP client function.

- **Section 2.3, "Configuring the Ethernet Interface"**
- **Section 2.16, "Setting the SNTP Server Function or SNTP Client Function"**

Note

If the DXP is in the system mode, time transmission by the SNTP server and time query by the SNTP client are not carried out.

SNTP Server Function

When a time query is received from a client on the network, the DXP returns its time information. The client does not need to log into the DXP.
The port number that the SNTP server function of the DXP uses is 123.

SNTP Client Function

Periodic Time Adjustment

Queries the time on a server at specified time intervals and sets the time information.

- **When Data Acquisition Is in Progress**
  If the time deviation between the time of the DXP internal clock and the correct time (the specified time) is within a specified value, the time on the DXP is adjusted gradually. Otherwise, the time is not corrected. For details, see section 1.10 in the DX100P/DX200P User's Manual.
- **When Data Acquisition Is Stopped**
  If the time deviation between the time of the DXP internal clock and the correct time (the specified time) is within ten minutes, the time of the DXP internal clock is changed immediately. Otherwise, the time is not corrected.

Time Setting When Data Acquisition Is Started

Queries the time on a server when data acquisition is started and sets the time information. After setting the time, data acquisition starts.

Note

- If a response is not received from the SNTP server within 2 seconds after executing the data acquisition start operation, the DXP starts data acquisition. If a response is received from the server afterwards, the time is adjusted according to the time correction operation during data acquisition.
- You can check the status information to see if the time query to the SNTP server was successful at the time data acquisition was started (see section 7.1).

Time Setting Using Keys

Queries the time on a server at an arbitrary time and sets the time information. The procedure below can be carried out when logged in as an administrator.

- **When Data Acquisition Is in Progress**
  If the time deviation between the time of the DXP internal clock and the correct time (the specified time) is within a specified value, the time on the DXP is adjusted gradually. Otherwise, the time is not corrected. For details, see section 1.10 in the DX100P/DX200P User's Manual.
- **When Data Acquisition Is Stopped**
  The time of the DXP internal clock is changed immediately.

Procedure

1. Press the FUNC key to display the FUNC menu.
2. Press the [SNTP] soft key.
   Time adjustment using the SNTP client function is executed.

Note

While waiting for a response from the SNTP server, you cannot operate the DXP using keys and/or the remote control function till the timeout period elapses.

3.1 Serial Interface Specifications

The specifications for the two types of serial interfaces (RS-232 and RS-422A/485) on the DXP are given below.

RS-232 Interface Specifications

Connector type	D-Sub 9 pin plug
Electrical, mechanical specifications	Conforms to the EIA-574 standard (for the 9-pin interface of the EIA-232 (RS-232) standard)
Connection	Point-to-point
Communication	Half-duplex
Synchronization	Start-stop synchronization
Baud rate	Select from 1200, 2400, 4800, 9600, 19200, or 38400[bps]
Start bit	1 bit (fixed)
Data length (Select 8 bits when outputting data in binary format.)	Select 7 or 8 bits
Parity	Select odd, even, or none
Stop bit	1 bit (fixed)
Hardware handshaking	Select whether to fix the RS and CS signals to TRUE or to use the signal for flow control.
Software handshaking	Select whether to use the X-ON and X-OFF signals to control the transmitted data only or both the transmitted and received data. X-ON (ASCII 11H), X-OFF (ASCII 13H)
Received buffer size	2047 bytes

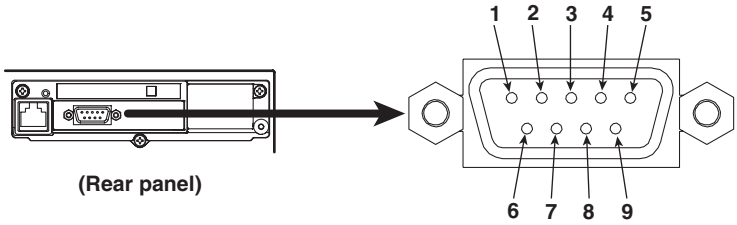
RS-422A/485 Interface Specifications

Terminal block type	6 point, terminal block, terminal screws: ISO M4/nominal length 6 mm		
Electrical, mechanical specifications	Conforms to EIA-422A (RS-422A) and EIA-485 (RS-485) standards		
Connection	Multidrop	Four-wire type Two-wire type	1 : 32 1 : 31
Communication	Half-duplex		
Synchronization	Start-stop synchronization		
Baud rate	Select from 1200, 2400, 4800, 9600, 19200, or 38400[bps]		
Start bit	1 bit (fixed)		
Data length	Select 7 or 8 bits		
Parity	Select odd, even, or none		
Stop bit	1 bit (fixed)		
Received buffer size	2047 bytes		
Escape sequence	Open and close		
Electric characteristics	FG, SG, SDB, SDA, RDB, RDA (six points) SG, SDB, SDA, RDB, and RDA terminals and the internal circuit of the DXP is functionally isolated. FG terminal is the frame ground.		
Communication distance	Up to 1.2 km		
Terminator	External: recommended resistance 120 Ω, 1/2 W		

3.2 RS-232 Interface Connector Pin Arrangement and Signal Names, the Connection Procedure, and Handshaking

Connector Pin Arrangement and Signal Names

Connector pin arrangement



Pin No.	Signal Name	Signal Meaning
2	RD (Received Data)	Received data from the PC. Input signal.
3	SD (Send Data)	Send data to the PC. Output signal.
5	SG (Signal Ground)	Signal ground.
7	RS (Request to Send)	Handshaking signal used when receiving data from the PC. Output signal.
8	CS (Clear to Send)	Handshaking signal used when sending data to the PC. Input signal.

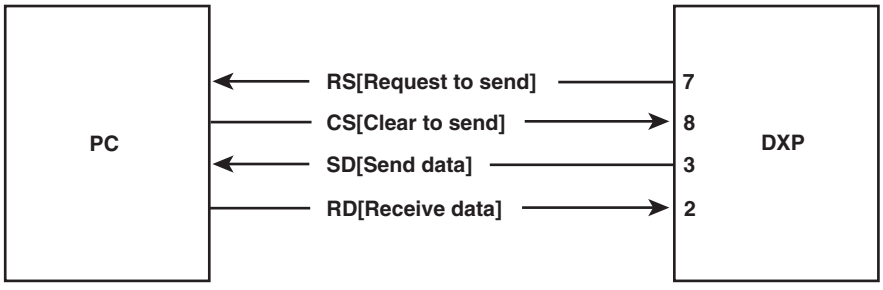
* Pins 1, 4, 6, and 9 are not used.

Table of RS-232 Standard Signal and Their JIS and ITU-T Abbreviations

Pin No. (9-pin connector)	Abbreviation			Description
	RS-232	ITU-T	JIS	
5	AB (GND)	102	SG	Signal ground
3	BA (TXD)	103	SD	Transmitted data
2	BB (RXD)	104	RD	Received data
7	CA (RTS)	105	RS	Request to send
8	CB (CTS)	106	CS	Clear to send

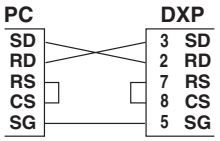
Connection Procedure

Signal direction

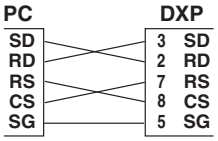


Connection example

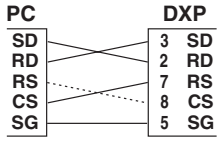
• OFF-OFF/XON-XON



• CS-RS(CTS-RTS)



• XON-RS(XON-RTS)



The RS on the PC side and the CS on the instrument side do not need to be connected for control. However, we recommend that they be connected so that the cable can be connected in either direction.

Handshaking

When using the RS-232 interface for transferring data, it is necessary for equipment on both sides to agree on a set of rules to ensure the proper transfer of data. The set of rules is called handshaking. Because there are many handshaking methods that can be used between the instrument and the PC, one must make sure that the same method is chosen by both the DXP and the PC. You can choose any of the four methods shown in the following table.

Table of Handshaking Methods (○ indicates that it is supported)

Handshaking method	Data Transmission Control (Control used to send data to a PC)			Data Reception Control (Control used to receive data from a PC)		
	Software handshaking	Hardware handshaking	No handshaking	Software handshaking	Hardware handshaking	No handshaking
	Stops transmission when X-OFF is received. Resume when X-ON is received.	Stops transmission when CB (CTS) is false. Resume when it is true.		Send X-OFF when the received data buffer is 3/4th filled. Send X-ON when the received data buffer becomes 1/4th filled.	Set CA (RTS) to False when the received data buffer is 3/4th filled. Set to True when the received data buffer becomes 1/4th filled.	
OFF-OFF			○			○
XON-XON	○			○		
XON-RS	○				○	
CS-RS		○			○	

OFF-OFF

- Data transmission control
  There is no handshaking between the DXP and the PC. The X-OFF and X-ON signals are treated as data, and the CS signal is ignored.
- Data reception control
  There is no handshaking between the DXP and the PC. When the received buffer becomes full, all overflow data are discarded.
  The RS signal is fixed to True.

XON-XON

- Data transmission control
  Software handshaking is performed between the DXP and the PC. When an X-OFF code is received while sending data to the PC, the DXP stops the data transmission. When it receives the next X-ON code, it resumes the data transmission. The CS signal received from the PC is ignored.
- Data reception control
  Software handshaking is performed between the DXP and the PC. When the amount of used space in the received buffer reaches 1537 bytes, the X-OFF code is transmitted. When the amount of used space in the received buffer falls to 511 bytes, X-ON code is transmitted. The RS signal is fixed to True.

XON-RS

- Data transmission control
  Software handshaking is performed between the DXP and the PC. When an X-OFF code is received while sending data to the PC, the DXP stops the data transmission. When it receives the next X-ON code, it resumes the data transmission. CS signal from the PC is ignored.
- Data reception control
  Hardware handshaking is performed between the DXP and the PC. When the amount of used space in the received buffer reaches 1537 bytes, the RS signal is set to “False.” When the amount of used space in the received buffer falls to 511 bytes, the RS signal is set to “True.”

CS-RS

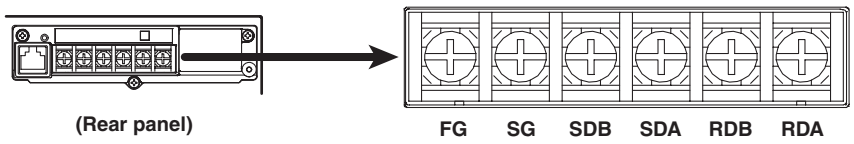
- Data transmission control
  Hardware handshaking is performed between the DXP and the PC. When the CS signal becomes False while sending data to the PC, the DXP stops the data transmission. When the CS signal becomes True, it resumes the data transmission. X-OFF is treated as data.
- Data reception control
  Hardware handshaking is performed between the DXP and the PC. When the amount of used space in the received buffer reaches 1537 bytes, the RS signal is set to “False.” When the amount of used space in the received buffer falls to 511 bytes, the RS signal is set to “True.”

Note

- The PC program must be designed so that the received buffers of both the DXP and the PC do not become full.
- When using XON-XON, output the data in ASCII format.

3.3 RS-422A/485 Interface Pin Arrangement, Signal Names, and the Connection Procedure

Pin Arrangement and Signal Names



FG (Frame Ground)	Case ground of the DXP.
SG (Signal Ground)	Signal ground.
SDB (Send Data B)	Send data B (+).
SDA (Send Data A)	Send data A (–).
RDB (Received Data B)	Received data B (+).
RDA (Received Data A)	Received data A (–).

Connection Procedure

Cable

There are two types of cables available, the four-wire cable and the two-wire cable (used only for the Modbus protocol). The cable should meet the following specifications.

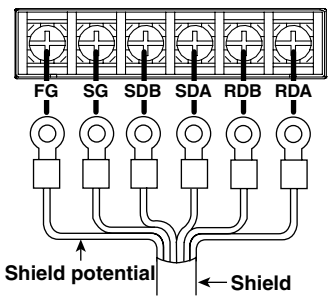
Cable	Twisted-pair cable 3 pairs 24 AWG or more (four-wire), 2 pair 24AWG or more (two-wire)
Characteristic impedance	100 Ω
Capacitance	50 pF/m
Cable length	Up to 1.2 km*

* The transmission distance of the RS-422A/485 interface is not the straight-line distance, but rather the total length of the (twisted-pair shielded) cable.

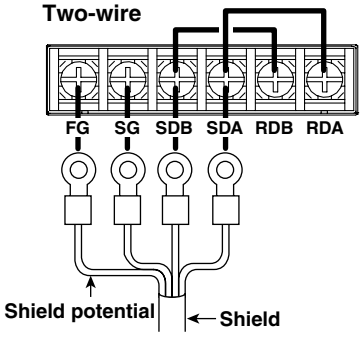
Cable connection procedure

As shown in the figure below, attach a crimp-style terminal with an isolating sleeve for 4-mm screws to the end of the cable. Keep the section that is exposed from the shielded cable to 5 cm or less.

Four-wire



Two-wire



WARNING

To prevent electric shock, turn OFF the power when connecting cables.

Note

- As shown on the next page, connect the RD pin to the SD (TD) pin on the PC (converter) side and the SD pin to the RD pin on the PC side.
- The two-wire cable can be used only when using the Modbus protocol.

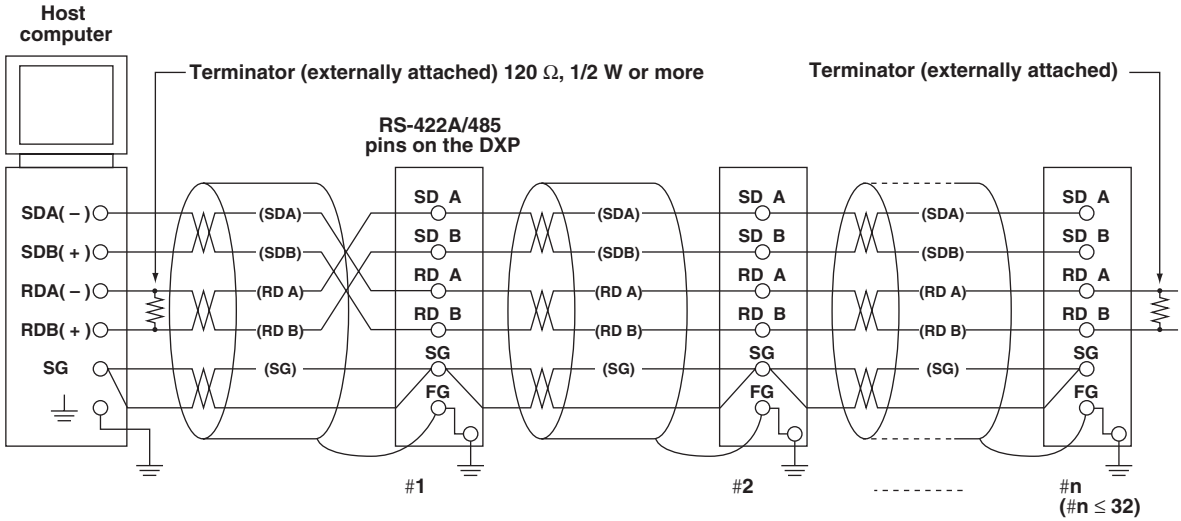
Connection Example with the Host Computer

The instrument can be connected to a host computer that has an RS-232, RS-422A, or RS-485 port.

- For RS-232, use the converter.
- For recommended converters, see the latter section “Serial Interface converter.”
- The two-wire cable can be used only when using the Modbus protocol. For the configuration procedure, see section 4.4

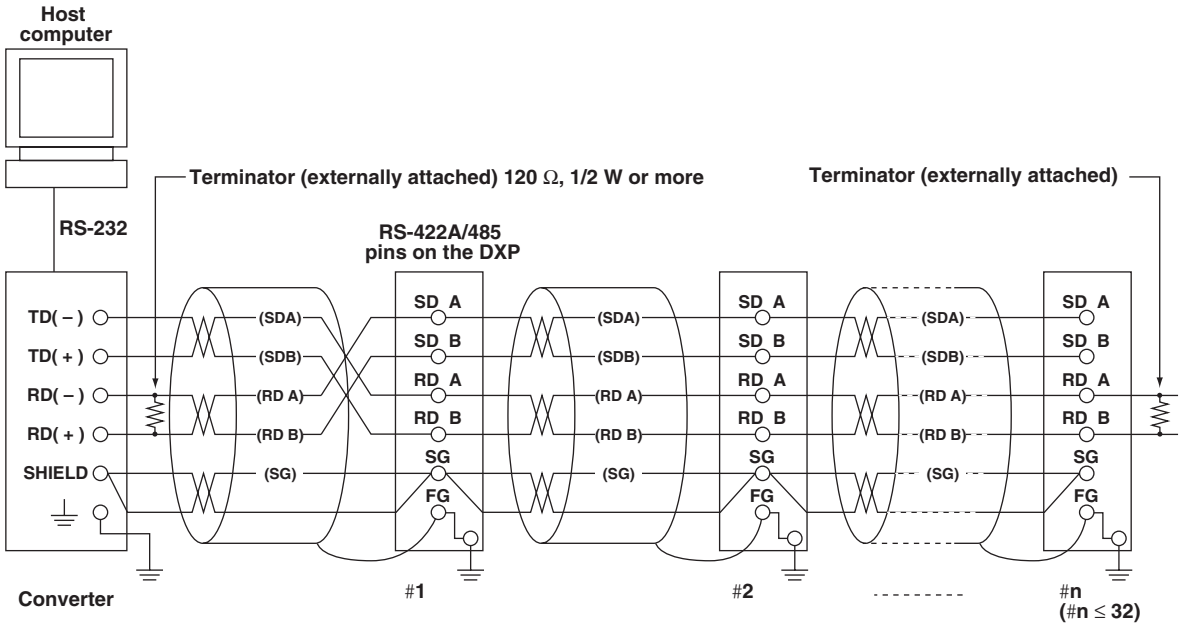
Four-wire system

In general, the instrument and the host computer are connected using a four-wire cable. For the four-wire system, the transmission and reception lines must be crossed.



Do not connect terminator to #1 to #n–1

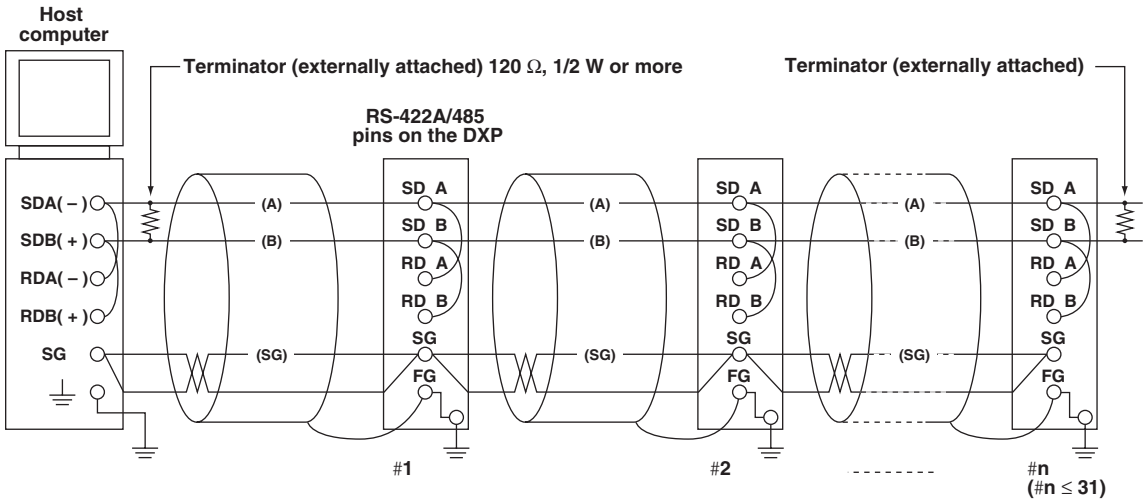
(The following diagram illustrates the case when the host computer's interface is RS-232)



Do not connect terminator to #1 to #n–1

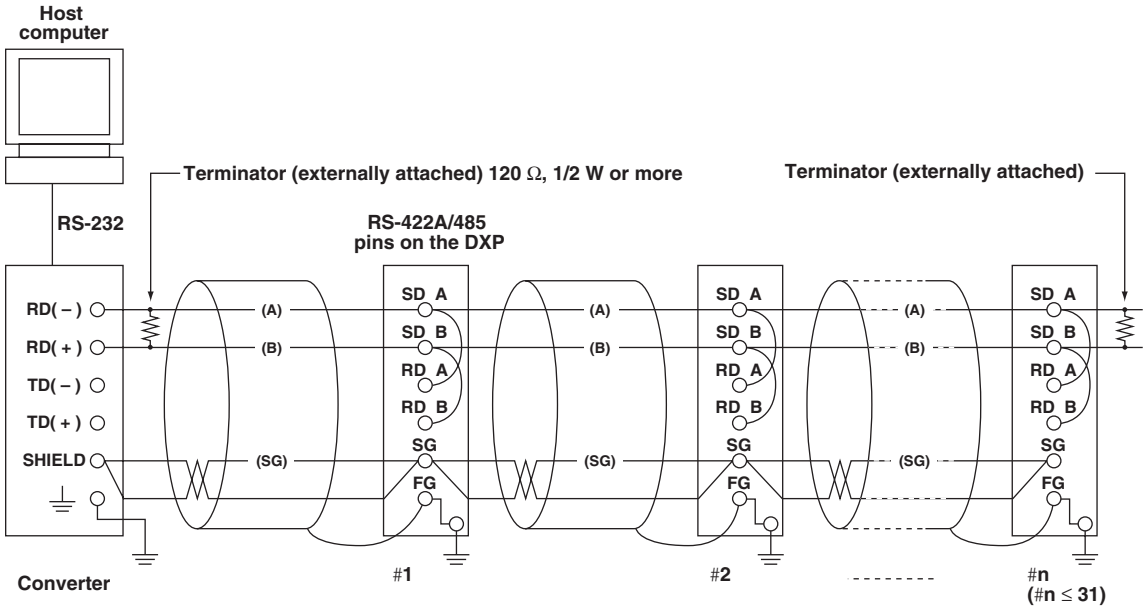
Two-wire system

Connect the transmission and reception signals with the same polarity on the RS-422A/485 terminal block. The two-wire system can be used only when using the Modbus protocol.



Do not connect terminator to #1 to #n–1

(The following diagram illustrates the case when the host computer's interface is RS-232)



Do not connect terminator to #1 to #n–1

Note

- The method used to eliminate noise varies depending on the situation. In the connection example, only the cable shield on the DXP side is connected to ground (one-sided grounding). This is effective when there is a difference in the electric potential between the PC's ground and the DXP's ground. This may be the case for long distance communications. If there is no difference in the electric potential between the PC and the DXP, two-sided grounding, in which the PC side is also grounded, may be effective. Furthermore, using two-sided grounding and connecting a serial capacitance on one-side may be effective. Consider these possibilities to eliminate noise.
- When using the two-wire type interface (Modbus protocol), the 485 driver must be set to high impedance within 3.5 characters after the last data byte is sent by the host computer.

Serial Interface Converter

Recommended converter: MODEL RC-57 by RA SYSTEMS CORP., or Z-101HE by Sharp

CAUTION

Some converters not recommended by Yokogawa have FG and SG pins that are not isolated. In this case, do not connect anything to the FG and SG pins as shown in the diagram on the previous page. This can generate a potential difference, especially for long distance communications, and can damage the instrument or cause communication abnormalities. For converters that do not have the SG pin, they can be used without using the signal ground. For details, see the manual that came with the converter.

On some non-recommended converters, the signal polarity may be reversed (A/B or +/– indication). In this case, reverse the connection.

For a two-wire system, the host computer must control the transmission driver of the converter in order to prevent collisions of transmit and received data. When using the recommended converter, the driver is controlled using the RS (RTS) signal on the RS-232.

When the instrument that support only the RS-422A interface exist in the system

When using the four-wire type interface, up to 32 DXPs can be connected to a single host computer. However, this may not be true if the instrument that support only the RS-422A interface exist in the system.

When YOKOGAWA's recorders that support only the RS-422A interface exist in the system

The maximum number of connection is 16. Some of YOKOGAWA's conventional recorders (HR2400 and μR, for example) only support the RS-422A driver. In this case, only up to 16 units can be connected.

Note

In the RS-422A standard, 10 is the maximum number of connections that are allowed on one port (for a four-wire system).

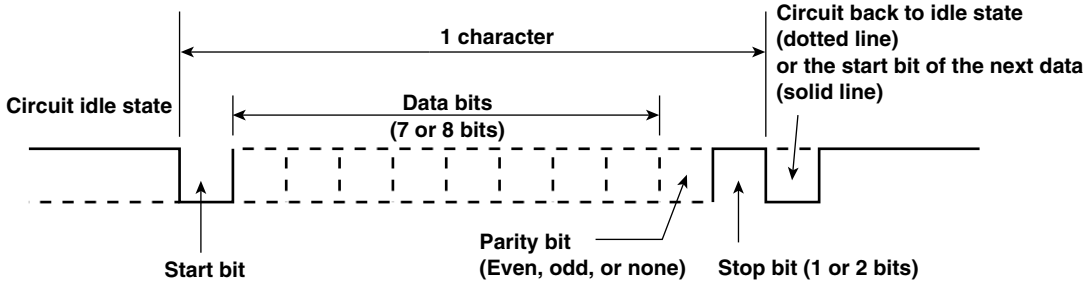
Terminator

When using a multidrop connection (including a point-to-point connection), connect a terminal resistance to the DXP on the end of the chain. Do not connect a terminal resistance to a DXP in the middle of the chain. In addition, turn the terminator on the host computer ON (see the computer's manual). If a converter is being used, turn ON its terminator. An external terminator must be attached to the recommended converter. However, there are converters that have built-in terminations.

3.4 The Bit Structure of One Character and the Operation of the Receive Buffer

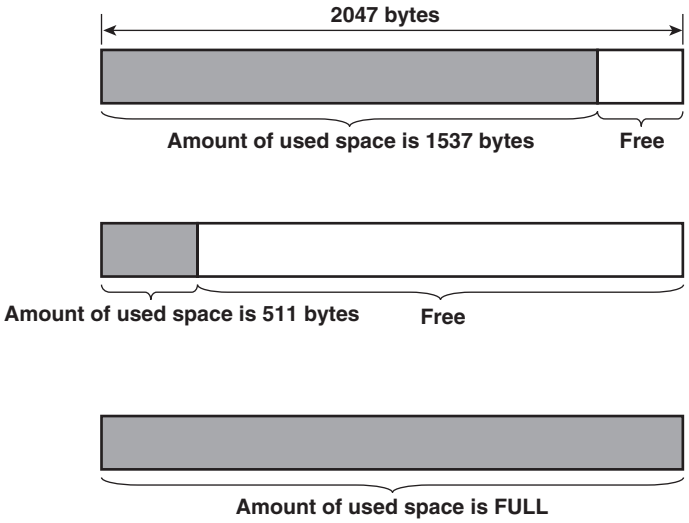
The Bit Structure of One Character

The serial interface on the DXP communicates using start-stop synchronization. With the start-stop synchronization, a start bit is added every time a character is transmitted. The start bit is followed by the data bits, parity bit, and stop bit. (See the figure below.)



Receive Buffer and Received Data

The data received from the computer are first placed in the receive buffer of the DXP. Depending on the available free space in the receive buffer, the received data are processed as shown in the figure below. When the receive buffer becomes FULL, overflow data are discarded.



When handshaking is used, the DXP stops data reception when data in the buffer cannot be processed fast enough and the amount of used space reaches 1537 bytes.

After the data reception is stopped as described above, data in the buffer continues to be passed to the internal program. When the amount of used space falls to 511 bytes, it resumes data reception.

If the buffer becomes full in spite of the handshaking control, all overflow data are discarded.

3.5 Configuring the Serial Interface

This section describes the setting procedure to use the setting/measurement function or the barcode input. To configure the interface for the Modbus, see chapter 4.

Explanation

Selecting the baud rate

Select the baud rate from the following list.
1200, 2400, 4800, 9600, 19200, 38400

Selecting the data length

Select the data length from the following list. Make sure to select 8 bits when outputting data in binary format.
7, 8

Selecting the parity check

Select the parity check from the following list.
Odd, Even, None

Selecting the handshaking method

Select the handshaking method from the following list.
This setting is valid only for the RS-232 interface.
Off:Off, XON:XON, XON:RS, CS:RS

Selecting the address

Select the address from the following values.
This setting is valid for the RS-422A/485 interface and the Modbus protocol.
1 to 32

Selecting the protocol

When using the setting/measurement function, select [Normal].
When using the barcode input function, select [Barcode].

Memory out

Select the communication type, Ethernet communications or serial communications, used to output the data on the external storage medium of the DXP using the ME command.*1

To use the serial communications, select [Serial]. *2

*1 This command can be used on either the Ethernet communications or serial communications.

*2 When the login function is enabled (any of administrators are registered), the ME command cannot be used via the serial communications. Selecting [Serial] causes no effect.

Storing the settings

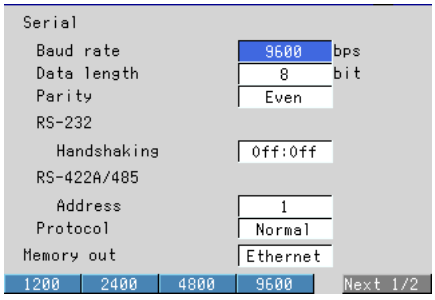
To activate the settings made in the system mode, the settings must be saved. Otherwise, the settings return to the previous values.

Procedure

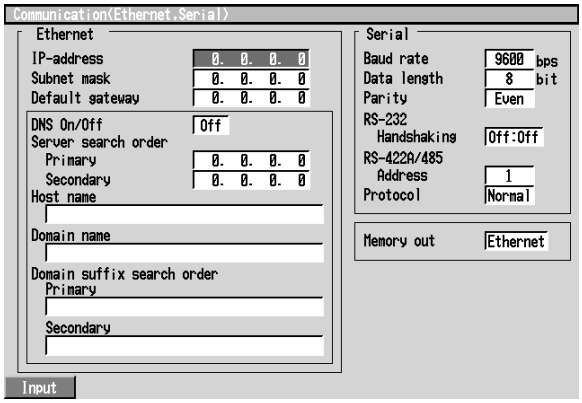
For the basic flow of operations, see “Flow of Operation using the Operation Keys” on page vi.

1. Enter the system mode.
2. Press the [#8 (Communication)](DX100P) or [#6 (Communication)](DX200P) soft key to display the communication function setting menu.
3. Press the [#6 (Serial, Memory out)](DX100P) or [#1 (Ethernet, Serial)](DX200P) soft key to display the communication (Serial) menu.

DX100P Communication (Serial, Memory out) menu

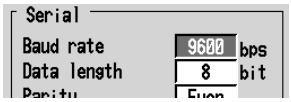


DX200P Communication (Ethernet, Serial) menu

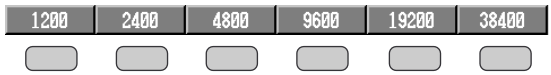


Selecting the baud rate

4. Press the arrow keys to move the cursor to the [Baud rate] box.



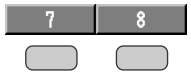
5. Press one of the soft keys from [1200] to [38400] to select the baud rate.



Selecting the data length

6. Press the arrow key to move the cursor to the [Data length] box.

7. Press the [7] or [8] soft key to select the data length.



Selecting the parity

8. Press the arrow keys to move the cursor to the [Parity] box.

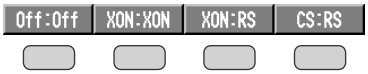
9. Press one of the soft keys from [Odd] to [None] to select the parity check.

Selecting the handshaking

(Valid only for the RS-232 interface.)

10. Press the arrow keys to move the cursor to the [Handshaking] box.

11. Press one of the soft keys from [Off:Off] to [CS:RS] to select the handshaking method.



Selecting the address

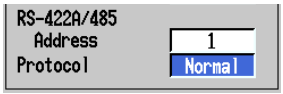
(Valid for the RS-422A/485 interface and the Modbus protocol)

12. Press the arrow keys to move the cursor to the [Address] box.

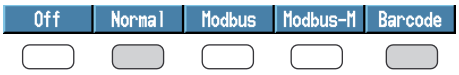
13. Press one of the soft keys from [1] to [32] to select the address.

Setting the protocol to "Normal"

14. Press the arrow keys to move the cursor to the [Protocol] box.



15. Press the [Normal] soft key or [Barcode] soft key.

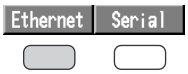


Setting the [Memory out]

The [Memory out] is displayed if the serial communication function is equipped.

16. Press the arrow key to move the cursor to the [Memory out] box.

17. Press the [Ethernet] soft key.



Confirming/Canceling the new settings

18. To confirm the new settings, press the DISP/ENTER key. To cancel, press the ESC key.

    For detailed operations regarding confirmation and cancellation, see "Flow of Operation using the Operation Keys" on page vi.

Storing the new settings

See "Flow of Operation using the Operation Keys" on page vi.

3.6 Using the Setting/Measurement Function

Connecting to the Function

Carry out the steps according to the PC, software, and network environment that you are using.

For RS-232

Connect the DXP and the PC. The DXP is ready to receive commands.

For RS-422A/485

After connecting the DXP and the PC, open the DXP using the open command (ESC o). The DXP is ready to receive commands.

Connectable Functions

Commands (output commands) of the monitor function and commands (a portion of the control commands) of the setting function can be used.

Communication Log

The commands and responses are recorded in the communication log.

Sending Commands to the DXP

Commands That Can Be Used without Logging into the DXP

Group	Parameter	Description	Ref. sections
Control commands			5.6
	CM	Sets the communication input data	
Output commands (control)			5.7
	BO	Sets the output byte order	
	IF	Sets the status filter	
	CS	Sets the checksum	
Output commands (Setup, measured, and computed data output)			5.7
	FC	Outputs screen image data	
	FE	Outputs setup data	
	FD	Outputs the most recent measured/computed data	
	FF	Outputs FIFO data	
	FL	Outputs logs, alarm summary, and message summary	
	FI	Outputs a selected operation log	
	IS	Outputs status information	
	FU	Outputs user level	
RS-422A/485 dedicated commands			5.8
	Esc o	Opens the instrument	
	Esc c	Closes the instrument	

Note

- If the login function is not used, the PC connects to the setting function of the DXP. In this case, setting commands of engineering mode (section 5.4), setting commands of system mode (section 5.5), and control commands (section 5.6) can be used in addition to the commands described above.
- The CM command can only used by a specified user (see section 2.6).

Commands That Can Be Used When Logged into the DXP

Users that are registered in the DXP and are allowed to login via communications can log in. The following commands can be executed by logging in. To log in, use the LL command (see section 5.6).

Group	Command	Ref. Section
Control commands	FR, UD, PS, AK, EV, MS, TL, EM, BB, BC, BQ, BJ, EJ, SD, SY, CL, LO, and LL	5.6

Note

- Only an administrator can execute the commands below.
  FR, BQ, SD, and CL commands
- Commands that correspond to operations that are restricted for the logged in user cannot be executed. The relationship between the commands and the setup items in login mode of a user is indicated below. For the setup procedure, see section 4.4 in the DX100P/DX200P User's Manual.

Command	Setup Item in Login Mode
UD	DISP/ENTER
PS0	START
PS1	STOP
AK	Alarm ACK
EV2	Snapshot
EV0, EV3, EV4	Save data
MS, BJ	Message
TL	Computation
EM	E-mail
BB, BC	Batch
SY	Other
LO	MENU

Disconnecting the RS-422A/485 Connection

The connection is dropped in the following cases.

- **When a command for dropping the connection is sent.**
  Send the close command (ESC c).
- **When another device is opened.**
  Example: If you open the DXP at address 2 while the DXP at address 1 is open, the DXP at address 1 is automatically closed.

Note

If the login function is not used, the PC connects to the setting function of the DXP. In this case, when a command for exiting the system mode (EC or YE command) is executed, the connection is dropped.

3.7 Using Barcode Input

Connecting the Barcode Reader

Follow the operating procedures for the barcode reader that you are using.

Procedure

Connecting the Barcode Reader to the DXP

1. Turn OFF the DXP and connect the barcode reader to the RS-232 interface connector.
2. Turn ON the DXP.
   The DXP is ready to receive commands.

Controlling the DXP Using the Barcode Reader

Explanation

Commands That Can Be Used

Parameter	Description
BV	**Enters characters** This command is valid when the cursor is at an item that requires character strings to be entered or when a window for entering character strings is displayed. However, passwords cannot be entered.
BB	**Sets batch number and lot number** Enter this command when the DXP is in operation mode to enter the batch number and lot number.
BC	**Sets batch comment** Enter this command when the DXP is in operation mode to enter a batch comment.
BJ	**Writes arbitrary message** Enter this command while measurement is in progress (memory start) to enter arbitrary messages.
BP	**Makes login operation easier** Enters the user name or the user name and user ID when logging in. The password is entered using keys.
KE	**Operates individual key operations** Operates in the same fashion as the key on the DXP is pressed.
Output commands All commands can be used.	

* BB, BC, and BJ commands are the same as for the setting/measurement function.
BV, KE, and BP commands are commands dedicated to barcodes.

For details on commands, see chapter 5.

Usage

The command encoded into barcodes is read by the barcode reader to control the DXP.

Operations that can be performed using keys of the DXP can be controlled. However, the limitation on the operation for each user is the same as for key operation. If a user that is not allowed to perform the operation is logged in, these commands cannot be executed (see the note under “Commands That Can Be Used When Logged into the DXP” on the previous page).

Output commands can be executed regardless of the login condition.

Operation Log

Operations are recorded in the DXP operation log.

Barcode Reader

Operations have been confirmed with barcode readers listed below.

- Model: MS9540-RS (with the RS-232 interface)
  Manufacturer: Metrologic Instruments Inc.
- Model: LS1902T-RS (with the RS-232 interface)
  Manufacturer: Symbol Technologies Inc.
  * As the number of characters that can be assigned to the header is relatively small, you may have some restrictions on the usage for some DXP applications.

Procedure

Some examples using barcodes is used to explain the procedure.

Note

The *"CRLF"* used in this section denotes a terminator. For details on terminator, see page 5-2.

Example 1: Logging in using a user name ABC2001 and user ID 5555

While logged out, enter the command "`BP2,ABC2001,5555`*CRLF*" in the barcode reader.

The user name and user ID are entered, and the password input window appears (the password is entered using the keys).

Note

- Commands can be entered collectively or in divided segments when using barcodes. Commands can be divided at an arbitrary point. For example, you can enter the following sequence of command segments for example 1:
  "`BP2`" "`,`" "`ABC2001`" "`,`" "`5555`" "*CRLF*"
- For a barcode reader equipped with a function that automatically attaches the header and footer to the command before transmission, you can set "BP2," for the header, "*CRLF*" for the footer, and enter "`ABC2001,5555`".

Example 2: Set the batch number to Process1, lot number to 0031, and wait for start

With the measurement stopped, enter the command
"`BBProcess1,0031;KESTART`*CRLF*" using the barcode reader.

The batch number and lot number are set, and the start window appears.

Example 3: Set the file header to "process sample" in the engineering mode.

1. Move the cursor to the [Header] item.*
   * You can enter the string using the barcode reader also if you open the window for entering strings by pressing the [Input] soft key.
2. Enter "`BV0,process sample`*CRLF*" using the barcode reader.
   "process sample" is set in the [Header] box.

4.1 Modbus Protocol Specifications

The Modbus protocol can be used over the serial interface (RS-232 or RS-422A/485). The Modbus specifications of the DXP are as follows.

Specification	Description
Transmission medium	RS-232 or RS-422A/485
Control (Flow control is not available.)	RS-232: None only RS-422A/485: None only
Baud rate	Select from 1200, 2400, 4800, 9600, 19200, or 38400 [bps]
Start bit	1 bit (fixed)
Stop bit	1 bit (fixed)
Parity check	Odd, Even, None
Transfer mode	RTU (Remote Terminal Unit) mode only • Data length: 8 bits • Data interval: time equivalent to 24 bits or less* • Error detection: Uses CRC-16 * Time interval equivalent to 3.5 characters or more is used to detect the end of the message.
Slave address	RS-232: 1 to 32 RS-422A/485: 1 to 32

The function code of Modbus protocol that are supported by the DXP are as follows.

Slave

The DXP does not support commands that are broadcasted.

Function Code	Function	Operation
3	Reading the hold register (4xxxx).*1	The master device can read the communication input data of the DXP that are written to the communication input data using function code 6 or 16.
4	Reading the input register (3xxxx).	The master device loads the computed, measured, and time data of the DXP.
6	Writing to the hold register (4xxxx)*1	The master device writes to the communication input data of the DXP.
8	Loopback test	Supports message return (test code (0x00*2)) in response to a loopback test by the master device.
16	Writing to the hold register (4xxxx)*1	The master device writes to the communication input data of the DXP.

*1 Set the user using the communication input data to [Serial] (see section 2.6), otherwise access to the hold register (function codes 3, 6, and16) are not allowed.
*2 Hexadecimal “00”

Master

Function Code	Function	Operation
3	Reading the hold register (4xxxx, 4xxxxx).	The DXP reads the hold register data of another device and make it the communication input data (Cxx).
4	Reading the input register (3xxxx, 3xxxxx).	The DXP reads the input register data of another device and make it the communication input data (Cxx).

Note

Set the user that uses the communication input data to [Serial] (see section 2.6), otherwise Modbus mater function is not enabled.

4.2 Register Assignments

The register assignments of the Modbus protocol are given below. The data in the register do not contain unit and decimal position information. The unit and decimal position information must be set to the Modbus master (host) beforehand.
A binary value is put into the registers with the upper byte first.

Input register	Data
30001	Measured data of CH01
:	:
30030	Measured data of CH30
• The corresponding registers: 30001 to 30002 on the DX102P. 30001 to 30004 on the DX104P. 30001 to 30006 on the DX106P. 30001 to 30012 on the DX112P. 30001 to 30004 on the DX204P. 30001 to 30008 on the DX208P. 30001 to 30010 on the DX210P. 30001 to 30020 on the DX220P. 30001 to 30030 on the DX230P.	
• Measured data is a “16-bit signed integer.” For the values, refer to the measured data in binary format (page 6-21).	
31001	Alarm status of the measured data of CH01
:	:
31030	Alarm status of the measured data of CH30
• The corresponding registers: 31001 to 31002 on the DX102P. 31001 to 31004 on the DX104P. 31001 to 31006 on the DX106P. 31001 to 31012 on the DX112P. 31001 to 31004 on the DX204P. 31001 to 31008 on the DX208P. 31001 to 31010 on the DX210P. 31001 to 31020 on the DX220P. 31001 to 31030 on the DX230P.	
• Alarm status is a “16-bit unsigned integer.” For the values, refer to the alarm status in binary format (page 6-21). The register holds the data in the order as A2A1A4A3.	
32001	Computed data of CH31 (upper byte)
32002	Computed data of CH31 (lower byte)
32003	Computed data of CH32 (upper byte)
:	:
32060	Computed data of CH60 (lower byte)
• The corresponding registers: 32001 to 32016 on the DX102P/DX104P/DX204P/DX208P. 32001 to 32024 on the DX106P/DX112P.. 32001 to 32060 on the DX210P/DX220P/ DX230P.	
• These registers are for models with the computation function option /M1.	
• Computed data is a “32-bit signed integer.” Two registers are assigned per a computed data. For the values, refer to the computed data in binary format (page 6-21).	
33001	Alarm status of the computed data of CH31
:	:
33030	Alarm status of the computed data of CH60
• The corresponding registers: 33001 to 33008 on the DX102P/DX104P/DX204P/DX208P. 33001 to 33012 on the DX106P/DX112P. 33001 to 33030 on the DX210P/DX220P/ DX230P.	
• These registers are for models with the computation function option /M1.	
• Alarm status is a “16-bit unsigned integer.” For the values, refer to the alarm status in binary format (page 6-21). The register holds the data in the order as A2A1A4A3.	
39001	Year (4 digits)
39002	Month
39003	Day
39004	Hour
39005	Minute
39006	Second
39007	Millisecond
39008	Summer/Winter time

Hold register	Data
40001	Communication input data of C01
:	:
40030	Communication input data of C30
A value in the range from –32768 to 32767 can be written in the hold register. For DX100P, the hold register is from 40001 to 40012 (from C01 to C12.)	

4.3 Modbus Error Response (Modbus Slave)

When using the Modbus slave function, the DXP returns the error codes below to the master device. For the error messages related to communications that the DXP displays, see appendix 6.

Code	Meaning	Cause
1	Bad function code	Requested a function that is not supported. For supported functions, see section 4.1, “Modbus Protocol Specifications.”
2	Bad register number	Tried to read/write to a register that has no corresponding channel.
3	Bad number of registers	The number of specified registers is zero.
7	Cannot be executed.	Tried to read a computation register from a model that has no computation option.

However, no response is returned for the following cases.

- CRC error
- Errors other than the ones shown above.

4.4 Setting the Configuration that is Used When the Modbus Protocol is Used

Explanation

Selecting the baud rate

Select the baud rate from the following list.
1200, 2400, 4800, 9600, 19200, 38400

Selecting the parity check

Select the parity check from the following list.
Odd, Even, None

Selecting the slave address (valid when Modbus slave function is engaged)

Select the address from the following values.
1 to 32

Selecting the protocol

- Modbus
  Use Modbus slave protocol.
- Modbus-M
  Use Modbus master protocol.

Storing the settings

To activate the settings made in the system mode, the settings must be saved. Otherwise, the settings return to the previous values.

Note

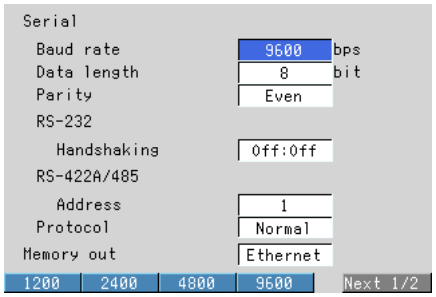
- When using the Modbus protocol, [Data length] and [Handshaking] settings are invalid.
- The [Memory output] setting is not related to Modbus.

Procedure

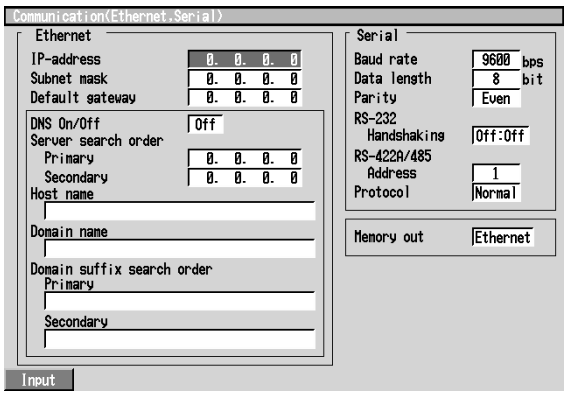
For the basic flow of operations, see “Flow of Operation using the Operation Keys” on page vi.

1. Enter the system mode.
2. Press the [#8 (Communication)](DX100P) or [#6 (Communication)](DX200P) soft key to display the communication function setting menu.
3. Press the [#6 (Serial, Memory out)](DX100P) or [#1 (Ethernet, Serial)](DX200P) soft key to display the communication (Serial) menu.

DX100P Communication (Serial, Memory out) menu



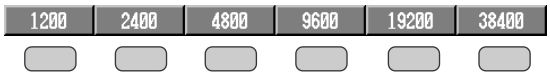
DX200P Communication (Ethernet, Serial) menu



Selecting the baud rate

4. Press the arrow keys to move the cursor to the [Baud rate] box.

5. Press one of the soft keys from [1200] to [38400] to select the baud rate.



Selecting the parity check

6. Press the arrow keys to move the cursor to the [Parity] box.

7. Press one of the soft keys from [Odd] to [None] to select the parity check.

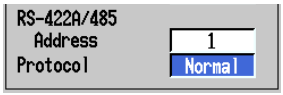
Selecting the slave address (valid when Modbus slave function is engaged)

8. Press the arrow keys to move the cursor to the [Address] box.

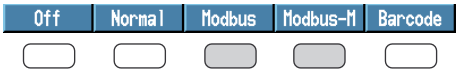
9. Press one of the soft keys from [1] to [32] to select the address.

Setting the protocol

10. Press the arrow keys to move the cursor to the [Protocol] box.



11. Press the [Modbus] soft key when using the Modbus slave function.
    Press the [Modbus-M] soft key when using the Modbus master function.



Confirming/Canceling the new settings

12. To confirm the new settings, press the DISP/ENTER key. To cancel, press the ESC key.

    For detailed operations regarding confirmation and cancellation, see “Flow of Operation using the Operation Keys” on page vi.

Storing the new settings

See “Flow of Operation using the Operation Keys” on page vi.

4.5 Setting the Modbus Master Function

Explanation

Selecting the read cycle

The cycle at which data is read from other devices. Select the read cycle from the following:

125 ms, 250 ms, 500 ms, 1 s, 5 s, 2 s, 10 s

Selecting the timeout time

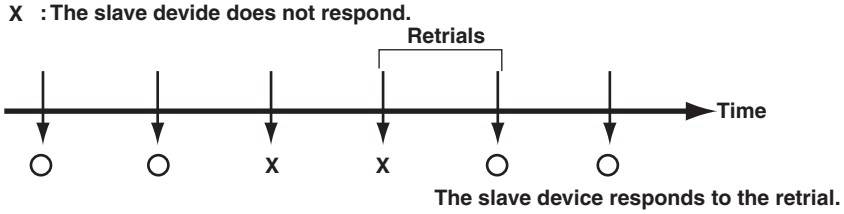
If there is no response from the specified slave device after transmitting a command from the DXP over the time specified here (timeout time), the DXP repeats the operation of sending the command the specified number of retrials (see below) and waiting. If there is no response from the slave device after the specified number of retrials, the DXP stops sending commands to the slave device.

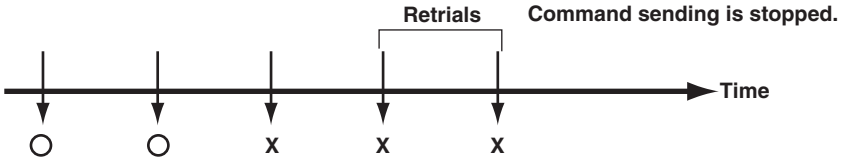
Operation when there is no response from the slave device (the number of retrials is set to 2)

: Commands are sent to the slave device at the read cycle.

○ : The slave device responds.

X : The slave devide does not respond.





Select the timeout time from the following:

125 ms, 250 ms, 500 ms, 1 s, 2 s, 5 s, 10 s, and 1 min

Selecting the number of retrials

The number of times to retransmit the command when there is no response from the specified slave device. If there is no response from the slave device after the specified number of retrials, the DXP stops sending commands to the slave device. Select the number of retrials from the following:

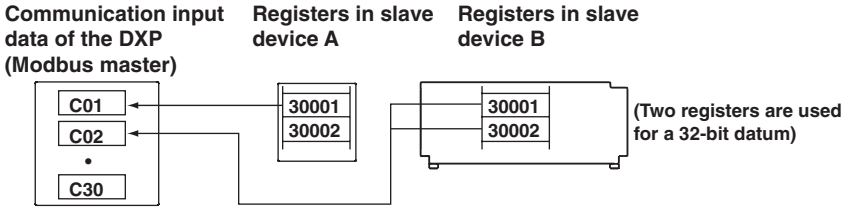
Off (0), 1, 2, 3, 4, 5, 10 and 20

Setting the command

The commands are used to read data from slave devices at the read cycle, and put them to the communication input data of the DXP. Data from the consecutive registers with the same type of data in a slave device, can be read and put to the consecutive communication input data of the DXP using a command.

- **Turning On/Off the command**
  Turn On the command registration line to be used. Up to eight commands can be registered.

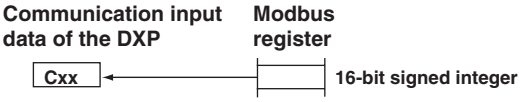
- **Read channel (start CH, end CH)**
  Specify which communication input data will be assigned the data that is read from the slave device (DX100P: C01 to C12, DX200P: C01 to C30).



- **Address**
  Specify the address of the slave device from the following:
  1 to 247

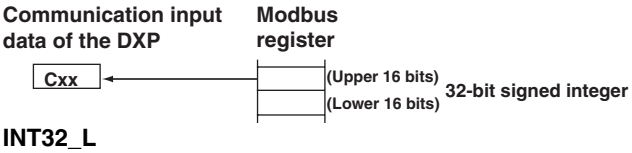
- **Register**
  Specify the register number of the slave device. 32-bit data is assigned to two registers. Thus, specify the smaller register number (see “Type” below).
  Input register: 30001 to 39999, 300001 to 365535
  Hold register: 40001 to 49999, 400001 to 465535

- **Type**
  Specify the type of data that is assigned to the Modbus register of the slave device (the DXP reads all data as floating point data).
  - **INT16**
    Specify this parameter when a “16-bit signed integer” is assigned to the Modbus register.

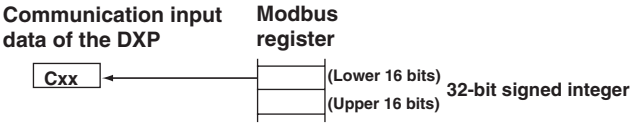


  - **UINT16**
    Specify this parameter when a “16-bit unsigned integer” is assigned to the Modbus register.

  - **INT32_B**
    Specify this parameter when a “32-bit signed integer” is assigned to the Modbus register in the order upper 16 bits followed by the lower 16 bits.
    Specify the smaller register number (the higher register number in this case) in Register.



  - **INT32_L**
    Specify this parameter when a “32-bit signed integer” is assigned to the Modbus register in the order lower 16 bits followed by the upper 16 bits.
    Specify the smaller register number (the lower register number in this case) in Register.



- **UINT32_B**
  Specify this parameter when a “32-bit unsigned integer” is assigned to the Modbus register in the order upper 16 bits followed by the lower 16 bits.
  Specify the smaller register number (the higher register number in this case) in Register.

- **UINT32_L**
  Specify this parameter when a “32-bit unsigned integer” is assigned to the Modbus register in the order lower 16 bits followed by the upper 16 bits.
  Specify the smaller register number (the lower register number in this case) in Register.

- **FLOAT_B**
  Specify this parameter when a “32-bit floating-point data” is assigned to the Modbus register in the order upper 16 bits followed by the lower 16 bits.
  Specify the smaller register number (the higher register number in this case) in Register.

- **FLOAT_L**
  Specify this parameter when a “32-bit floating-point data” is assigned to the Modbus register in the order lower 16 bits followed by the upper 16 bits.
  Specify the smaller register number (the lower register number in this case) in Register.

Setting Example

If you set as shown in the figure below, the DXP reads an “INT16” value from register 30001 to put it to C01, and an “INT16” value from register 30002 to C02.

Displaying the read data

The data that is read can be displayed by writing a computing equation using C01 through C30 (C01 to C12 for DX100P) on a computation channel (/M1 option). The decimal position and the unit are specified by the slave device. Convert the read value to a value with an appropriate unit using the computation equation (see an example below). For information on the use of the computation channel, see the DX100P/DX200P User’s Manual (IM04L05A01-01E/IM04L06A01-01E).

Example

Assigns the communication input data C01 to the computation channel 31.

Read an “INT16” value from register 30001 of the slave device with the address “1,” to put it to the communication input data C01 of the DXP. Change the value to have two digits of decimal fraction (multiply 0.01) and a unit “V.”

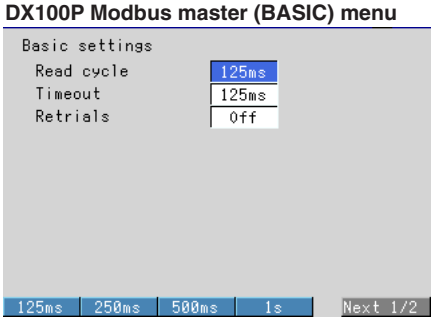
- **Command**
  First communication data: 01, Address: 1, Register: 30001, Type: INT16
- **Computation channel**
  Computation equation for Channel 31: C01*K01
  Unit: V
  Constant: K01=0.01

Procedure

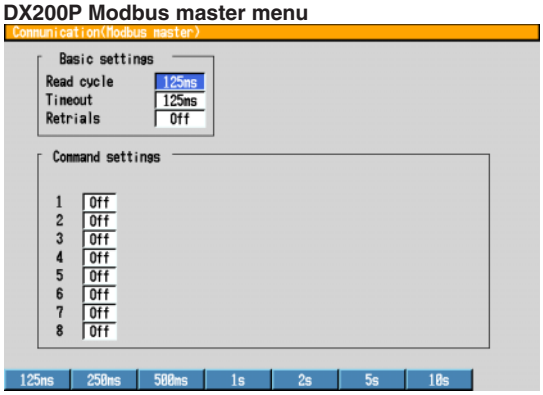
For the basic flow of operations, see “Flow of Operation using the Operation Keys” on page vi. For the procedures related to entering character strings and values, see the DX100P/DX200P User’s Manual (IM04L05A01-01E/IM04L06A01-01E).

1. Enter the system mode.
2. Press the [#8 (Communication)](DX100P) or [#6 (Communication)](DX200P) soft key to display the communication function setting menu.
3. Press the [#7 (Modbus master (BASIC))] or [#4 (Modbus Master)] soft key to display the Modbus master (BASIC) menu.

DX100P Modbus master (BASIC) menu

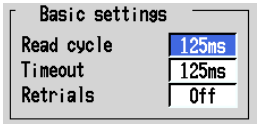


DX200P Modbus master menu

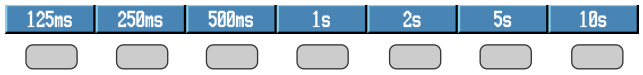


Selecting the read cycle

4. Press the arrow keys to move the cursor to the [Read cycle] box.

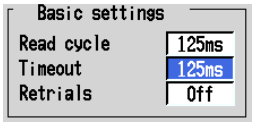


5. Press one of the soft keys from [125ms] to [10s] to select the read cycle.

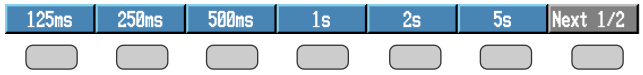


Selecting the timeout time

6. Press the arrow keys to move the cursor to the [Time out] box.

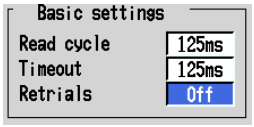


7. Press one of the soft keys from [125ms] to [1min] to select the timeout time.



Selecting the number of retrials

8. Press the arrow keys to move the cursor to the [Retrials] box.



9. Press one of the soft keys from [Off] to [20] to select the address.

For DX100P, confirm the new settings pressing the DISP/ENTER key. To cancel, press the ESC key.

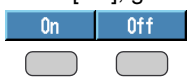
For detailed operations regarding confirmation and cancellation, see "Flow of Operation using the Operation Keys" on page vi.

Setting the command

For DX100P, when settings are confirmed by step 9, press the ESC key to return to the communication function setting menu, and then press the [#8 (Modbus master (COMMAND))] soft key to display the command setting menu.

10. Press the arrow keys to move the cursor to the [On/Off] box.

11. Press either the [On] or [Off] soft key. If you select [On], go to step 12. If you select [Off], go to step 23.



- **Communication input data (First, Last)**

12. Press the arrow key to move the cursor to the [First channel] box.

13. Press one of the soft keys from [C01] to [C12] (DX100P) or [C01] to [C30] (DX200P) to select the first communication input data.

14. Set the last communication input data using the same method as steps 12 and 13.

- **Slave address**

15. Press the arrow key to move the cursor to the [Address] box.

16. Press the [Input] soft key to display the entry box.

17. Enter the slave address in the entry box.

- **Register**

18. Press the arrow key to move the cursor to the [Register] box.

19. Press the [Input] soft key to display the entry box.

20. Enter the slave address in the entry box

- **Type**

21. Press the arrow key to move the cursor to the [Type] box.

22. Press one of the soft keys from [INT16] to [FLOAT_L] to select the register type.

Confirming/Canceling the new settings

23. To confirm the new settings, press the DISP/ENTER key. To cancel, press the ESC key.

For detailed operations regarding confirmation and cancellation, see “Flow of Operation using the Operation Keys” on page vi.

Storing the new settings

See “Flow of Operation using the Operation Keys” on page vi.

4.6 Checking the Operating Status of the Modbus Master Function

Displaying the read data

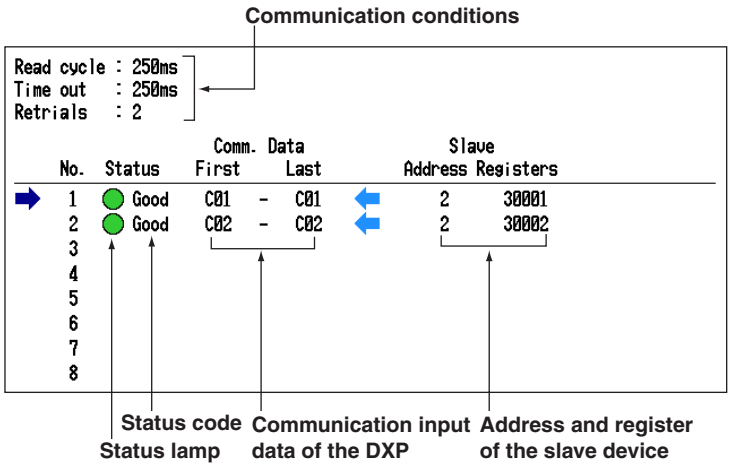
The data that is read can be displayed by writing a computing equation using the communication input data on a computation channel (/M1 option). For information on the use of the computation channel, see the DX100P/DX200P User's Manual (IM04L05A01-01E/IM04L06A01-01E).

Confirming the Modbus Status

Explanation

MODBUS STATUS screen

You can check the operating status of the Modbus master function on the MODBUS STATUS screen.



Communication condition

The communication status is displayed through the status lamp and the detail code.

Status Lamp	Detail Code	Meaning
Green	GOOD	Communication is operating normally.
Yellow		Retrying.
Red		Communication is suspended as it is not recovered after the specified number of retrials.
	NONE	No response from the slave device.
	FUNC	The slave device cannot execute the command from the DXP.
	REGI	The slave device does not have the specified register.
	ERR	There is an error in the response data from the slave device.
	(Space)	The detail code is not displayed until the status is confirmed when communication is started.

Resuming command transmission

Through key operation, you can resume command transmission to the slave device to which the command transmission is stopped (indicated by a red status lamp).

Data while retrying/when command transmission is stopped

While retrying, the communication input data (Cxx) is held at the latest value. When command transmission is stopped, the communication input data turns to be an error data. In this case, computation channels display "+*******."

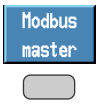
Data dropout

Data dropout occurs when commands 1 through 8 cannot be completed in a read cycle (see appendix 5). The communication input data (Cxx) is held at the previous value. Take measures such as making the read cycle longer or reducing the number of commands.

Procedure

Displaying the MODBUS STATUS screen

1. Press the FUNC key. The FUNC menu appears. The structure of the FUNC menu varies depending on the basic settings and options.
2. Press the [Modbus master] soft key. The Modbus status screen appears.



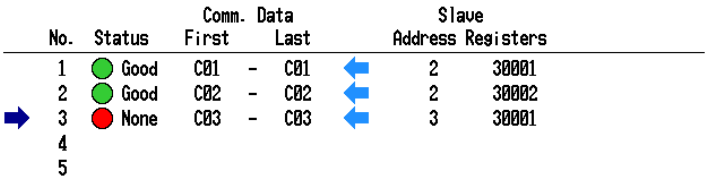
Data dropout

When a data dropout occurs, the message “Data dropout” is displayed on the MODBUS STATUS screen.

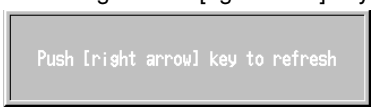
Press the right arrow key to clear the message.

Resuming command transmission to the slave device to which command transmission is stopped due to timeout

1. Using the up and down arrow keys, select the command corresponding to the slave device to which transmission will be resumed.



A message “Push [right arrow] key to refresh” appears.

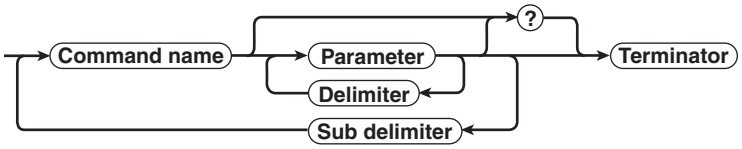


2. Press the right arrow key to start command transmission to the specified slave device.

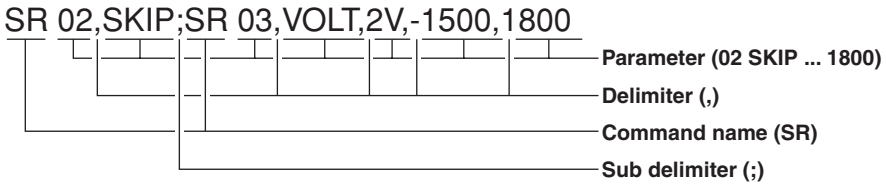
5.1 Command Syntax

Command Syntax

The syntax of the engineering mode setting/system mode setting/control/output commands (see sections 5.4 to 5.7) of the instrument is given below. ASCII codes are used for the character codes. For the syntax of the maintenance/test commands (see section 5.9) and instrument information output commands (see section 2.15), see the corresponding sections or the examples for each command.



Command example



Command name

Defined using two alphabet characters.

Parameter

- Command parameters.
- Set using alphabet characters or numerical values.
- Parameters are separated by delimiters.
- When the parameter is a numerical value, the valid range varies depending on the command.
- Spaces before and after of the parameter are ignored (except for parameters that are specified using an ASCII character string (unit), when spaces are valid.)
- You can omit the parameters that do not need to be changed from their current settings. However, delimiters cannot be omitted.

  Example `SR 01,,2V`<terminator>

  If multiple parameters are omitted and delimiters occur at the end of the command, those delimiters can be omitted.

  Example `SR 01,VOLT,,,`<terminator> → `SR 01,VOLT`<terminator>
- The number of digits of the following parameters is fixed. If the number of digits is not correct when entering the command, a syntax error results.
  - Date YY/MM/DD (8 characters)
    YY: Year (Enter the lower two digits of the year.)
    MM: Month
    DD: Day
  - Time HH:MM:SS (8 characters)
    HH: Hour
    MM: Minute
    SS: Second
  - Channel number: 2 characters
  - Relay number: 3 characters (example: `I02`)

Query

- A question mark is used to specify a query.
- By placing a query after a command or parameter, the setting information of the corresponding command can be queried. Some commands cannot execute queries. For the query syntax of each command, see sections 5.4 to 5.7.
  Example 1 `SR[ p1]?` `SR? or SR p1?` can be executed.
  Example 2 `SA[ p1[,p2]]?` `SA?, SA p1? or SA p1,p2?` can be executed.

Delimiter

- A comma is used as a delimiter.
- Parameters are separated by delimiters.

Sub delimiter

- A semicolon is used as a sub delimiter.
- By separating each command with a sub delimiter, up to 10 commands can be specified one after another. However, the following commands that make the DXP output data and the commands that disconnect the connection cannot be specified one after another. Use them independently.
  - `FC, FE, FD, FF, IS, FU, FL, ME, YE,` and `EC` commands.
  - Queries

* If there are consecutive sub delimiters, they are considered to be single. In addition, sub delimiters at the front and at the end are ignored.
Example `;SR01,VOLT;;;SR02,VOLT;`<terminator> is taken to be `SR01,VOLT;SR02,VOLT`<terminator>.

Terminator (Terminating character)

Use either of the following two characters for the terminator.

- CR + LF (`0DH 0AH` in ASCII code.)
- LF (`0AH` in ASCII code.)

Note

- Do not specify a channel or relay number that is not available on the DXP. An error will occur.
- The total data length from the first character to the terminator must be less than 2047 bytes.
- Commands are not case sensitive (with the exception of user-specified character strings).
- All the commands that are listed using sub delimiters are executed even if one of the commands is erroneous.
- Spaces that are inserted before and after a parameter are ignored. However, if spaces are inserted before a command, after a sub delimiter, or after a query, an error occurs.

Response

The DXP returns a response (affirmative/negative response) to a command that is delimited by a single terminator*. The controller should follow the one command to one response format. When the command-response rule is not followed, the operation is not guaranteed. For the response syntax, see chapter 6.

* Commands dedicated to RS-422A/485 (see section 5.8) and instrument information output commands (section 2.15) are exceptions.

5.2 A List of Commands

The DXP has the following four modes. Syntax error will occur if you attempt to execute a command in the wrong mode. Query commands can be executed regardless of the mode.

Mode	Description	Sign used in the table
Log out	No user logs in.	LO
Operation mode	Mode in which measurement is performed.	O
Engineering mode	Mode in which measurement range and other parameters are specified.	E
System mode	Mode in which basic information is specified.	S

Setting Commands (Engineering Mode)

- These commands can be specified when the DXP is in the engineering mode.
- In order to activate the settings that are changed using the commands, the settings must be saved using the BE command. Otherwise, new settings will not be activated.
- The settings that are returned in response to a query in the engineering mode will contain the new settings even if they are not saved with the BE command. However, the new settings will not be activated until they are saved.

Command Name	Function	Execution Mode	Setting Function	Monitor Function	Page
SR	Sets the input range	E	Yes	No	5-10
SO	Sets the computing equation	E	Yes	No	5-11
SA	Sets the alarm	E	Yes	No	5-11
SW	Sets the display update rate/auto-save interval	E	Yes	No	5-12
SZ	Sets the zone	E	Yes	No	5-12
SP	Sets the partial expanded display	E	Yes	No	5-12
ST	Sets the tag	E	Yes	No	5-13
SX	Sets the group	E	Yes	No	5-13
SL	Sets the trip line	E	Yes	No	5-13
SG	Sets the message	E	Yes	No	5-13
SH	Sets the file header	E	Yes	No	5-13
SE	Sets the display direction, background color, trend line width, trip line width, number of grids, scroll time, and scale digit	E	Yes	No	5-14
SB	Sets the number of scale divisions, base position of the bar graph, and the display position of the trend scale	E	Yes	No	5-14
SV	Sets the moving average of the measured channel	E	Yes	No	5-14
SF	Sets the filter	E	Yes	No	5-14
SC	Sets the channel display color	E	Yes	No	5-14
SQ	Sets the LCD brightness and the screen backlight saver	E	Yes	No	5-15
SU	Sets the USER key	E	Yes	No	5-15
SK	Sets the computation constant	E	Yes	No	5-15
SI	Sets the rolling average of the computation channel	E	Yes	No	5-15
SJ	Sets the TLOG timer	E	Yes	No	5-15
BD	Sets the alarm delay time	E	Yes	No	5-16
BG	Sets the message group	E	Yes	No	5-16
BL	Sets use/not use the lot number and automatic increment of the lot number	E	Yes	No	5-16
BH	Sets the batch header	E	Yes	No	5-16

Yes: Command usable
No : Command unusable

Command Name	Function	Execution Mode	Setting Function	Monitor Function	Page
EH	Sets the calibration correction	E*	Yes	No	5-16
RD	Sets whether to use DST	E	Yes	No	5-17
RT	Sets the DST start/end time	E	Yes	No	5-17

* If the DXP is configured to allow the calibration correction settings to be changed while data acquisition is in progress, an administrator can use the EH command even when data acquisition is in progress (see page 2-23).

Setting Commands (System Mode)

- These commands can be specified when the DXP is in the system mode.
- In order to activate the settings that are changed using the commands, the settings must be saved using the YE command. Otherwise, new settings will not be activated.
- The settings that are returned in response to a query in the system mode will contain the new settings even if they are not saved with the YE command. However, the new settings will not be activated until they are saved.

Command Name	Function	Execution Mode	Setting Function	Monitor Function	Page
XA	Sets alarm related settings	S	Yes	No	5-18
XI	Sets the A/D integral time	S	Yes	No	5-18
XB	Sets the burn out	S	Yes	No	5-18
XJ	Sets the RJC	S	Yes	No	5-18
XV	Sets the scan interval	S	Yes	No	5-18
BI	Sets the application	S	Yes	No	5-18
XT	Selects the temperature unit	S	Yes	No	5-19
XS	Sets the channels to display the trend and acquire the data	S	Yes	No	5-19
XM	Sets the conditions used to acquire display/event data to the internal memory or save the data to the external storage medium	S	Yes	No	5-19
XU	Sets the channel identification display, memory alarm time, language, whether or not to use the partial expanded display, and the remote controller ID	S	Yes	No	5-19
XR	Sets the remote action	S	Yes	No	5-19
XQ	Sets the timer	S	Yes	No	5-20
RO	Sets the report type and generation time	S	Yes	No	5-20
RM	Sets the report channel	S	Yes	No	5-21
XO	Selects the communication interface used to output files on the external storage medium using ME command	S	Yes	No	5-21
XG	Sets the time zone	S	Yes	No	5-21
XP	Sets the date and time for the memory timeup	S	Yes	No	5-21
BR	Sets the system relays	S	Yes	No	5-22
YA	Sets the IP address, subnet mask, and default gateway	S	Yes	No	5-22
YK	Sets keepalive	S	Yes	No	5-22
YN	Sets the DNS	S	Yes	No	5-22
YQ	Sets the communication timeout	S	Yes	No	5-22
EQ	Sets the user that can use the communication input data	S	Yes	No	5-23
YS	Sets the serial interface	S	Yes	No	5-23
YT	Sets the files to be transferred using FTP client	S	Yes	No	5-23
YG	Sets whether or not to use the Web server	S	Yes	No	5-23
YL	Sets the Modbus master	S	Yes	No	5-23
YM	Sets the commands for Modbus master	S	Yes	No	5-23

Command Name	Function	Execution Mode	Setting Function	Monitor Function	Page
YU	Sets the contents of the e-mail	S	Yes	No	5-24
YV	Sets the recipient's address	S	Yes	No	5-24
YW	Sets the sender's address	S	Yes	No	5-25
YX	Sets the SMTP server	S	Yes	No	5-25
EF	Sets the FTP client	S	Yes	No	5-25
EG	Sets the Web server	S	Yes	No	5-25
RG	Sets the time deviation limit	S	Yes	No	5-25
XC	Sets the cyclical use of the storage area of the external storage medium (Media FIFO)	S	Yes	No	5-25
RC	Enables/Disables setting changes when data acquisition is in progress	S	Yes	No	5-25
WA	Sets the SNTP server function	S	Yes	No	5-25
WB	Sets the SNTP client function	S	Yes	No	5-26
WC	Sets the SNTP client function when data acquisition is started	S	Yes	No	5-26
Commands used to set the login information*					
BN	Sets the login function	S	Yes	No	5-26
BS	Sets the electronic signature function	S	Yes	No	5-26
EK	Sets administrators	E*, S	Yes	No	5-26
EL	Sets users	E*, S	Yes	No	5-27
BW	Sets the login mode: sign authority level	S	Yes	No	5-27
BK	Sets the login mode: key operations	S	Yes	No	5-27
BM	Sets the login mode: alarm ACK and removal of Zip disk	S	Yes	No	5-27
BF	Sets the login mode: FUNC key operations, etc.	S	Yes	No	5-27
EI	Sets whether or not to use the setting of calibration correction and measuring range	E*, S	Yes	No	5-28

* If the DXP is configured to allow users to be registered while data acquisition is in progress, an administrator can use the EK, EL, and EI commands even when data acquisition is in progress (see page 2-23).

Control Commands

Command Name	Function	Execution Mode	Setting Function	Monitor Function	Page
CC	Disconnects an Ethernet connection (This command can be used only during Ethernet communications)	O, E, S	Yes	Yes	5-28
FR	Sets the acquiring interval to the FIFO buffer	O, E	Yes	No	5-28
EE	Switches the mode from the operation mode	O*	Yes	No	5-28
UD	Switches the screen	O	Yes	No	5-29
PS	Starts/stops measurements (Memory start/stop)	O	Yes	No	5-30
AK	Confirms the alarm status (alarm acknowledge)	O	Yes	No	5-30
EV	Manual sample, snapshot, saving the display data, and saving the event data	O	Yes	No	5-30
MS	Writes the message (display and save)	O	Yes	No	5-30
TL	Starts/stops/resets computation (MATH)/ Clears the computation dropout status display	O	Yes	No	5-31
EM	Starts/stops the e-mail transmission function	O	Yes	No	5-31
BB	Sets the batch No. ans lot No.	O	Yes	No	5-31
BC	Sets the batch comment	O	Yes	No	5-31
BQ	Acknowledges user locked status	O	Yes	No	5-31
BJ	Writes the free message	O	Yes	No	5-31
CM	Sets the communication input data	O, E	Yes	Yes	5-31
EJ	Changes the password	O	Yes	No	5-31
SD	Sets the date and time	O, E**	Yes	No	5-31

Command Name	Function	Execution Mode	Setting Function	Monitor Function	Page
BE	Saves the setup data for the engineering mode	E*	Yes	No	5-32
SY	Sets the 4 panel display (only for DX200P)	O, E	Yes	No	5-32
ME	Outputs data saved in the external storage medium (Either Ethernet or serial communication can be used)	O, E	Yes	No	5-32
EC	Clears the measured/computed data, initializes the setup data	S	Yes	No	5-33
YE	Saves the setup data for the system mode	S	Yes	No	5-33
CL	Executes the time adjustment using the SNTP client function	E	Yes	No	5-33
LO	Loads the engineering mode settings	E	Yes	No	5-33
LL	Log in via the serial interface (can only be used during serial communication)	E	Yes	No	5-34
Barcode Dedicated Commands					
BV	Enters characters	O, E, S,LO			5-34
BP	Enters the user name or the user name and user ID when logging in	LO			5-34
KE	Executes key operations	O, E, S,LO			5-34

* If the DXP is configured to allow settings to be changed while data acquisition is in progress, an administrator can use the EE and BE commands even when data acquisition is in progress (see page 2-23).

** If the DXP is configured to allow the time to be adjusted while data acquisition is in progress, an administrator can use the SD command even when data acquisition is in progress (see page 2-23).

Output Commands

Command Name	Function	Execution Mode	Setting Function	Monitor Function	Page
Control					
BO	Sets the output byte order	O, E, S	Yes	Yes	5-35
CS	Sets the checksum (This command can be used only during serial communications)	O, E, S	Yes	Yes	5-35
IF	Sets the status filter	O, E, S	Yes	Yes	5-35
Setup, measured, and computed data output					
FC	Outputs screen image data	O, E, S	Yes	Yes	5-35
FE	Outputs decimal position, unit information, and setup data	O, E, S	Yes	Yes	5-35
FD	Outputs the most recent measured/computed data	O, E	Yes	Yes	5-35
FF	Outputs FIFO data	O, E	Yes	Yes	5-36
FL	Outputs logs, alarm summary, and message summary	O, E, S	Yes	Yes	5-36
FI	Outputs a selected operation log	O, E, S	Yes	Yes	5-36
IS	Outputs status information	O, E, S	Yes	Yes	5-37
FU	Outputs user information	O, E, S	Yes	Yes	5-37

RS-422A/485 dedicated commands

Command Name	Function	Execution Mode	Page
Esc O	Opens the instrument	O, E, S	5-38
Esc C	Closes the instrument	O, E, S	5-38

Maintenance/Test Commands (Available when using the maintenance/test server function via Ethernet communications)

Command Name	Function	Setting Function	Monitor Function	Page
close	Disconnects the connection between other devices	Yes	No	5-38
con	Outputs connection information	Yes	Yes	5-38
eth	Outputs Ethernet statistical information	Yes	Yes	5-39
help	Outputs help	Yes	Yes	5-39
net	Outputs network statistical information	Yes	Yes	5-39
quit	Disconnects the connection of the device being operated	Yes	Yes	5-39

5.3 Input Range Parameter

The following tables show which measurement ranges of the instrument correspond to the input types of the SR command (input range setting command), VOLT, TC, RTD, DI, and SQRT. The table also shows the ranges for the upper and lower limits of the span.

DC Voltage (VOLT), Square Root (SQRT)

Measurement Range	Parameter for the SR Command	Value of the Upper and Lower Limits of the Span (Upper and Lower Limits of the Measurement Range)	Value of the Upper and Lower Limits of the SR Command
20 mV	20 mV	–20.00 to 20.00 mV	–2000 to 2000
60 mV	60 mV	–60.00 to 60.00 mV	–6000 to 6000
200 mV	200 mV	–200.0 to 200.0 mV	–2000 to 2000
2 V	2 V	–2.000 to 2.000 V	–2000 to 2000
6 V	6 V	–6.000 to 6.000 V	–6000 to 6000
20 V	20 V	–20.00 to 20.00 V	–2000 to 2000
50 V	50 V	–50.00 to 50.00 V	–5000 to 5000

Thermocouple (TC)

Measurement Range	Parameter for the SR Command	Value of the Upper and Lower Limits of the Span (Upper and Lower Limits of the Measurement Range)	Value of the Upper and Lower Limits of the SR Command
R	R	0.0 to 1760.0 °C	0 to 17600
S	S	0.0 to 1760.0 °C	0 to 17600
B	B	0.0 to 1820.0 °C	0 to 18200
K	K	–200.0 to 1370.0 °C	–2000 to 13700
E	E	–200.0 to 800.0 °C	–2000 to 8000
J	J	–200.0 to 1100.0 °C	–2000 to 11000
T	T	–200.0 to 400.0 °C	–2000 to 4000
N	N	0.0 to 1300.0 °C	0 to 13000
W	W	0.0 to 2315.0 °C	0 to 23150
L	L	–200.0 to 900.0 °C	–2000 to 9000
U	U	–200.0 to 400.0 °C	–2000 to 4000

Resistance Temperature Detector (RTD)

Measurement Range	Parameter for the SR Command	Value of the Upper and Lower Limits of the Span (Upper and Lower Limits of the Measurement Range)	Value of the Upper and Lower Limits of the SR Command
Pt100	PT	–200.0 to 600.0 °C	–2000 to 6000
JPt100	JPT	–200.0 to 550.0 °C	–2000 to 5500
Cu10 (GE)*	CU1	–200.0 to 300.0 °C	–2000 to 3000
Cu10 (L&N)*	CU2	–200.0 to 300.0 °C	–2000 to 3000
Cu10 (WEED)*	CU3	–200.0 to 300.0 °C	–2000 to 3000
Cu10 (BAILEY)*	CU4	–200.0 to 300.0 °C	–2000 to 3000
Cu10 α = 0.00392 at 20 °C*	CU5	–200.0 to 300.0 °C	–2000 to 3000
Cu10 α = 0.00393 at 20 °C*	CU6	–200.0 to 300.0 °C	–2000 to 3000
Cu25 α = 0.00425 at 0 °C*	CU25	–200.0 to 300.0 °C	–2000 to 3000

* Measurement range that can be specified on models with the Cu10, Cu25 resistance temperature detector option /N1.

Digital Input (DI)

Measurement Range	Parameter for the SR Command	Value of the Upper and Lower Limits of the Span (Upper and Lower Limits of the Measurement Range)	Value of the Upper and Lower Limits of the SR Command
Voltage	LEVEL	0 or 1*1	0 or 1
Contact	CONT	0 or 1*2	0 or 1

*1: "0" when less than 2.4 V, "1" when greater than or equal to 2.4 V.
*2: "0" when contact is OFF, "1" when contact is ON.

Note

For the measurement accuracy of each measurement range, see the DX100P/DX200P User's Manual (IM04L05A01-01E/IM04L06A01-01E)

5.4 Setting Commands (Engineering Mode)

SR Sets the input range

When setting channels to skip

Syntax SR p1,p2<terminator>
p1 Channel number (DX100P: 01 to 12, DX200P: 01 to 30)
p2 Range mode (SKIP)

Query SR[p1]?

Example Skips channel 01.
SR 01,SKIP

Description Measurements are not made on channels that are set to SKIP.

When setting the channels to voltage, thermocouple, RTD, or digital input

Syntax SR p1,p2,p3,p4,p5<terminator>
p1 Channel number (DX100P: 01 to 12, DX200P: 01 to 30)
p2 Input type
VOLT DC VOLTAGE
TC Thermocouple
RTD Resistance temperature detector
DI Digital input
p3 Measurement range
p4 Lower limit of span
p5 Upper limit of span

Query SR[p1]?

Example Set the input type for channel 01 to thermocouple type R, span lower limit to 0°C, and span upper limit to 1760.0°C.
SR 01,TC,R,0,17600

Description
- Set parameters p3, p4, and p5 according to the table in section 5.3.
- For parameters p4 and p5, enter a value using 5 digits or less excluding the decimal. The decimal position is fixed to the position indicated in the table in section 5.3.

When computing the difference between channels

Syntax SR p1,p2,p3,p4,p5,p6,p7<terminator>
p1 Channel number (DX100P: 01 to 12, DX200P: 01 to 30)
p2 Range mode (DELTA)
p3 Input type
VOLT DC VOLTAGE
TC Thermocouple
RTD Resistance temperature detector
DI Digital input
p4 Measurement range
p5 Lower limit of span
p6 Upper limit of span
p7 Reference channel (DX100P: 01 to 12, DX200P: 01 to 30)

Query SR[p1]?

Example Set the range mode of channel 10 to the difference computation between channels with the reference channel set to 01 and set the input type to TC. Set the range to R. Set the span lower limit to 10.0°C and span upper limit to 100.0°C.
SR 10,DELTA,TC,R,100,1000,01

Description
- Set parameters p4, p5, and p6 according to the table in section 5.3.
- For parameters p5 and p6, enter a value using 5 digits or less, excluding the decimal. The decimal position is fixed to the position indicated in the table in section 5.3.

When setting the scaling

Syntax SR p1,p2,p3,p4,p5,p6,p7,p8,p9,p10<terminator>
p1 Channel number (DX100P: 01 to 12, DX200P: 01 to 30)
p2 Range mode (SCALE)
p3 Input type
VOLT DC VOLTAGE
TC Thermocouple
RTD Resistance temperature detector
DI Digital input
p4 Measurement range
p5 Lower limit of span
p6 Upper limit of span
p7 Scaling lower limit (-30000 to 30000)
p8 Scaling upper limit (-30000 to 30000)
p9 Scaling decimal position (0 to 4)
p10 Unit (Up to 6 characters)

Query SR[p1]?

Example Convert the DC voltage measured on channel 02 to a DC current. Set the measurement range to 6 V, span lower limit to 1 V, span upper limit to 5 V, scaling lower limit to 1.00 A, and scaling upper limit to 5.00 A.
SR 02,SCALE,VOLT,6V,1000,5000,100,500,2,A

Description
- Set parameters p4, p5, and p6 according to the table in section 5.3.
- For parameters p5 and p6, enter a value using 5 digits or less excluding the decimal. The decimal position is fixed to the position indicated in the table in section 5.3.
- For parameters p7, p8, and p9, either set all three parameters or omit all three parameters.

When setting the square root

Syntax SR p1,p2,p3,p4,p5,p6,p7,p8,p9<terminator>
p1 Channel number (DX100P: 01 to 12, DX200P: 01 to 30)
p2 Range mode (SQRT)
p3 Measurement range
p4 Lower limit of span
p5 Upper limit of span
p6 Scaling lower limit

(-30000 to 30000)
p7 Scaling upper limit
(-30000 to 30000)
p8 Scaling decimal position (0 to 4)
p9 Unit (Up to 6 characters)

Query SR[p1]?

Example Convert the DC voltage measured on channel 01 to the amount of flow using the square root computation. Set the measurement range to 6 V, span lower limit to 1 V, span upper limit to 5 V, scaling lower limit to 10.0 m^3/s, and scaling upper limit to 100.0 m^3/s.
SR 01,SQRT,6V,1000,5000,100,1000,1,m3/S

Description
- Set parameters p3, p4, and p5 according to the table in section 5.3.
- For parameters p4 and p5, enter a value using 5 digits or less excluding the decimal. The decimal position is fixed to the position indicated in the table in section 5.3.
- For parameters p6, p7, and p8, either set all three parameters or omit all three parameters.

SO Sets the computing equation

Syntax SO p1,p2,p3,p4,p5,p6,p7<terminator>
p1 Computation channel number (DX100P: 31 to 42, DX200P: 31 to 60)
p2 Turn ON/OFF computation
p3 Computing equation (Up to 40 characters)
p4 Lower limit of span(–9999999 to 99999999)
p5 Upper limit of span(–9999999 to 99999999)
p6 Decimal position of span (0 to 4)
p7 Unit (Up to 6 characters)

Query SO[p1]?

Example Set the computation channel to 31, the computation to ON, the computing equation to the sum of channel 01 and 02, span lower limit to –10.0000, span upper limit to 15.0000, and the unit to V.
SO 31,ON,01+02,–100000,150000,4,V

Description
- This command can be used on models with the computation function option /M1.
- For computing equations, see the DX100P/ DX200P User's Manual.
- For parameters p4 and p5, enter a value using 7 digits or less ,excluding the decimal, for negative numbers and 8 digits or less for positive numbers.
- For parameters p4, p5, and p6, either set all three parameters or omit all three parameters.

SA Sets the alarm

When not using the alarm

Syntax SA p1,p2,p3<terminator>
p1 Channel number (DX100P: 01 to 12 or 31 to 42, DX200P: 01 to 60)
p2 Alarm number (1 to 4)
p3 Alarm ON/OFF state (OFF)

Query SA[p1[,p2]]?

Example Set off the alarm number 1 of channel 10.
SA 10,1,OFF

Description Computation channels (DX100P: 31 to 42, DX200P: 31 to 60) can be configured on products with the computation function option / M1.

When using the alarm

Syntax SA p1,p2,p3,p4,p5,p6,p7<terminator>
p1 Channel number (DX100P: 01 to 12 or 31 to 42, DX200P: 01 to 60)
p2 Alarm number (1 to 4)
p3 Alarm ON/OFF state (ON)
p4 Alarm type
H Upper limit alarm
L Lower limit alarm
h Difference upper-limit alarm
l Difference lower-limit alarm
R Upper limit on rate-of-change alarm
r Lower limit on rate-of-change alarm
T Delay upper limit alarm
t Delay lower limit alarm
(Upper and lower case letters are distinguished.)
p5 Alarm value
p6 Relay setting
ON Relay setting ON
OFF Relay setting OFF
p7 Relay number (DX100P: I01 to I06, DX200P: I01 to I06/ I11 to I16/ I21 to I26, I31 to I36)

Query SA[p1[,p2]]?

Example Set an upper limit alarm (alarm value = 1000) in alarm number 1 of channel 02, and activate relay number 1 when an alarm occurs.
SA 02,1,ON,H,1000,ON,I01

Description
- When the input range setting (SR command) is set to SKIP, p3 cannot be turned ON.
- When the computation channel setting (SO command) is turned OFF, p3 cannot be turned ON.
- The alarm settings are all turned OFF for the following cases.
  - When the input type is changed (VOLT, TC·····).
  - When the measurement range is changed.

  - When the span and scaling values are changed during scaling display (includes changing the decimal position).
  - When the computation channel is turned ON/OFF or when the computing equation or the span value is changed on the computation channel.
- The h and l settings of p4 are valid only when the measurement range is set to computation between channels.
- If p4 is set to R or r, set the interval for the upper/lower limit on the rate-of-change using the XA command.
- If p4 is set to T or t, set the alarm delay time for the delay upper/lower limit alarm using the BD command.
- For the range of alarm values of p5, see the table in section 5.3.
- Set the alarm value of a computation channel within the range of the span.
- For the alarm value of p5, enter a value using 5 digits or less, excluding the decimal. For computation channels, enter a value using 8 digits or less, excluding the decimal.
- An error occurs if a number of a relay that is not installed is specified in p7. For the procedures used to set the relay numbers, see the DX100P/DX200P User's Manual.
- Computation channels (DX100P: 31 to 42, DX200P: 31 to 60) can be configured on products with the computation function option /M1.
- For computation channels, the alarm types that can be specified are only H (upper limit alarm), L (lower limit alarm), T (delay upper limit alarm), and t (delay lower limit alarm).
- Use the XA command to set the alarm hysteresis. However, for computation channels, the alarm hysteresis is fixed to zero.

SW Sets the display update rate/ auto-save interval

Syntax `SW p1,p2<terminator>`

`p1` Display update rate (15s, 30s, 1MIN, 2MIN, 5MIN, 10MIN, 15MIN, 20MIN, 30MIN, 1H, 2H, 4H, 10H)

`p2` Auto-save interval (10MIN, 20MIN, 30MIN, 1H, 2H, 3H, 4H, 6H, 8H, 12H, 1DAY, 2DAY, 3DAY, 5DAY, 7DAY, 10DAY, 14DAY, 31DAY)

Query `SW?`

Example Set the display update rate to one minute and the auto-save interval to 10 minutes.

```
SW 1MIN,10MIN
```

Description
- The selectable auto-save interval (p2) varies depending on the display update rate (p1) setting. For details, see the DX100P/DX200P User's Manual.
- 15S and 30S of p1 apply only to models DX102P, DX104P, DX204P, and DX208P.
- When the application setting (BI command) is "Batch," the auto-save interval is fixed to an available maximum value. parameter p3 cannot be set arbitrarily.

SZ Sets the zone

Syntax `SZ p1,p2,p3<terminator>`

`p1` Channel number (DX100P: 01 to 12 or 31 to 42, DX200P: 01 to 60)

`p2` Zone lower limit (0 to 95)[%]

`p3` Zone upper limit (5 to 100)[%]

Query `SZ[ p1]?`

Example Display channel 02 in a zone between 30% and 50%.

```
SZ 02,30,50
```

Description
- Computation channels (DX100P: 31 to 42, DX200P: 31 to 60) can be configured on products with the computation function option /M1.
- The total display width of the screen in the direction of the amplitude is taken to be 100%.
- The zone width must be at least 5%.
- Set the parameters for the zone upper and lower limits so that the upper limit is greater than the lower limit.

SP Sets the partial expanded display

Syntax `SP p1,p2,p3,p4<terminator>`

`p1` Channel number (DX100P: 01 to 12 or 31 to 42, DX200P: 01 to 60)

`p2` Enable/disable (ON/OFF) the partial expansion setting.

`p3` Boundary position (1 to 99)[%]

`p4` Boundary value

Query `SP[ p1]?`

Example Partially expand the display of channel 01. Set the boundary position to 25% and the boundary value to 1.00 V.

```
SP 01,ON,25,100
```

Description
- Computation channels (DX100P: 31 to 42, DX200P: 31 to 60) can be configured on products with the computation function option /M1.
- When the input range setting (SR command) is set to SKIP, p2 cannot be turned ON.
- When the computation channel setting (SO command) is turned OFF, p2 cannot be turned ON.

- The range of the upper and lower limits of the span (scaling upper and lower limits when scaling is enabled) is taken to be 100% for parameter p3.
- Parameter p4 can be set in the range (span upper limit –1) to (span lower limit +1). If scaling is enabled, the range is (scaling upper limit –1) to (scaling lower limit +1).
- The decimal position and the number of digits become the same as the span and scaling settings (see the SR command).
- This command cannot be specified unless the partial expanded display function (p4) of the XU command is set to USE.
- This command cannot be specified if the partial expanded display range does not exist (when the span width is set to 1, for example).

ST Sets the tag

Syntax
```
ST p1,p2<terminator>
p1  Channel number (DX100P: 01 to 12 or
    31 to 42, DX200P: 01 to 60)
p2  Tag (Up to 16 characters)
```
Query
```
ST[ p1]?
```
Example
```
Set the tag of channel 02 to TAG2.
ST 02,TAG2
```
Description
- For the characters that can be used for the tags, see appendix 1, “ASCII Character Codes.” Note that semicolons and commas cannot be used.
- Computation channels (DX100P: 31 to 42, DX200P: 31 to 60) can be configured on products with the computation function option /M1.

SX Sets the group

Syntax
```
SX p1,p2,p3<terminator>
p1  Group number (1 to 6)
p2  Group name (Up to 16 characters)
p3  Channel construction
```
Query
```
SX[ p1]?
```
Example
```
Set channels 01, 03, 04 to 06 to group
number 1, and group name is GROUP2.
Set the channel configuration by using
periods "." to separate each channel or
by using a hyphen "-" to specify a range
of channels.
SX 1,GROUP2,01.03.04-06
```
Description
- An error occurs if a number of a channel that is not installed in the instrument is specified.
- An error occurs if a number of a computation channel that is not provided on the instrument is specified.
- For the characters that can be used for the group name, see appendix 1, “ASCII Character Codes.” Note that semicolons and commas cannot be used.

SL Sets the trip line

Syntax
```
SL p1,p2,p3,p4,p5<terminator>
p1  Group number (1 to 4)
p2  Number of trip line (1 to 4)
p3  Turn ON/OFF the trip line display
p4  Display position (0 to 100)[%]
p5  Display color (RED, GREEN, BLUE,
    B.VIOLET, BROWN, ORANGE, Y.GREEN,
    LIGHTBLUE, VIOLET, GRAY, LIME, CYAN,
    DARKBLUE, YELLOW, LIGHTGRAY, PURPLE)
```
Query
```
SL[ p1[,p2]]?
```
Example
```
Display trip line 1 in red for group 1.
SL 1,1,ON,RED
```
Description The total display width of the screen in the direction of the amplitude is taken to be 100%.

SG Sets the message

Syntax
```
SG p1,p2,p3<terminator>
p1  Message group number (1 to 7)
p2  Message number (1 to 8)
p3  Message (Up to 32 characters)
```
Query
```
SG[ p1,p2]?
```
Example
```
Set character string "MESSAGE1" to
message number 1 of the message group 2.
SG 2,1,MESSAGE1
```
Description For the characters that can be used for the message, see appendix 1, “ASCII Character Codes.” Note that semicolons and commas cannot be used.

SH Sets the file header

Syntax
```
SH p1,p2<terminator>
p1  Header for the files saved to the
    external storage medium (Up to 32
    characters)
p2  Directory (Up to 8 characters)
```
Query
```
SH?
```
Example
```
Add a header, DATA1 and save the file to
the DATAFILE directory.
SH DATA1,DATAFILE
```
Description “Data to be saved to the external storage medium” includes the display, event, TLOG, manual sampled, report data, and screen image data.

SE Sets the display direction, background color, trend line width, trip line width, number of grids, scroll time, and scale digit

Syntax SE p1,p2,p3,p4,p5,p6,p7,p8<terminator>
p1 Display direction of the trend waveform (HORIZONTAL, VERTICAL, HORIZON2)
p2 Display direction of the bar graph waveform (HORIZONTAL, VERTICAL)
p3 Background color (WHITE, BLACK)
p4 The line width of the trend (1 to 3)[dot]
p5 The width of the trip line (1 to 3)[dot]
p6 Number of grids (4 to 12, AUTO)
p7 The time interval (scroll time) for switching displayed group (5s, 10s, 20s, 30s, 1min)
p8 Scale digit (NORMAL, FINE)

Query SE?

Example Set the display direction of the trend waveform to horizontal, the direction of the bar graph to vertical, the background color to white, the line width of the trend to 1 dot, the width of the trip line to 2 dots, the number of grids to 10, the time interval for switching displayed group to 20s, and the scale digit to NORMAL.
SE HORIZONTAL,VERTICAL,WHITE,1,2,10,20s,NORMAL

SB Sets the number of scale divisions, base position of the bar graph, and the display position of the trend scale

Syntax SB p1,p2,p3,p4<terminator>
p1 Channel number (DX100P: 01 to 12 or 31 to 42, DX200P: 01 to 60)
p2 Number of scale divisions (4 to 12, C10)
p3 Base position of the bar graph display (NORMAL, CENTER)
p4 Position of the scale for the trend display (OFF, DX100P: 1 to 6, DX200P: 1 to 10)

Query SB[p1]?

Example Set the number of scale divisions of the bar graph of channel 02 to 5, and display the bar graph from the span lower limit (scaling lower limit if scaling is enabled). Display the scale at the third position.
SB 02,5,NORMAL,3

Description
- Computation channels (DX100P: 31 to 42, DX200P: 31 to 60) can be configured on products with the computation function option /M1.
- The base position (p3) is valid when the display direction of the bar graph is set to HORIZONTAL. Use the SE command to set the display direction of the bar graph.

SV Sets the moving average of the measured channel

Syntax SV p1,p2<terminator>
p1 Channel number (DX100P: 01 to 12, DX200P: 01 to 30)
p2 Number of times to measure the moving average (OFF, 2 to 16) [times]

Query SV[p1]?

Example Set the number of times to measure the moving average on channel 02 to 12.
SV 02,12

Description This command can be used on models DX106P, DX112P, DX210P, DX220P, and DX230P.

SF Sets the filter

Syntax SF p1,p2<terminator>
p1 Channel number (DX100P: 01 to 04, DX200P: 01 to 08)
p2 Filter (OFF, 2S, 5S, 10S)

Query SF[p1]?

Example Set the filter on channel 02 to 2 s.
SF 02,2s

Description
- An error occurs if a channel number other than those shown above is specified.
- This command can be used on models DX102P, DX104P, DX204P and DX208P.

SC Sets the channel display color

Syntax SC p1,p2<terminator>
p1 Channel number (DX100P: 01 to 12 or 31 to 42, DX200P: 01 to 30)
p2 Display color (RED, GREEN, BLUE, B.VIOLET, BROWN, ORANGE, Y.GREEN, LIGHTBLUE, VIOLET, GRAY, LIME, CYAN, DARKBLUE, YELLOW, LIGHTGRAY, PURPLE)

Query SC[p1]?

Example Set the display color of channel 02 to blue.
SC 02,BLUE

Description Computation channels (DX100P: 31 to 42, DX200P: 31 to 60) can be configured on products with the computation function option / M1.

SQ Sets the LCD brightness and the screen backlight saver

When the screen backlight saver function is OFF

Syntax SQ p1,p2<terminator>
p1 LCD brightness (DX100P: 1 to 8, DX200P: 1 to 4)
p2 Screen backlight saver function ON/OFF (OFF)
Query SQ?
Example Set the LCD brightness to 2 and the screen backlight saver function to OFF.
SQ 2,OFF

When the screen backlight saver function is ON

Syntax SQ p1,p2,p3,p4<terminator>
p1 LCD brightness (DX100P: 1 to 8, DX200P: 1 to 4)
p2 Screen backlight saver function ON/OFF (ON)
p3 Time after which to enable the screen saver function (1MIN, 2MIN, 5MIN, 10MIN, 30MIN, 1H)
p4 Factors that causes the screen to return from the saver mode (KEY, KEY+ALM)
Query SQ?
Example Set the LCD brightness to 2, the screen backlight saver function to ON, the time after which to enable the screen backlight saver function to 1MIN, and the factor that causes the screen to return from the saver mode to KEY.
SQ 2,ON,1MIN,KEY

SU Sets the USER key

Syntax SU p1<terminator>
p1 Key action
NONE No action
ALARMACK Alarm acknowledge
MANUALSAMPLE Manual sampling
MESSAGE1 Write message 1
MESSAGE2 Write message 2
MESSAGE3 Write message 3
MESSAGE4 Write message 4
MESSAGE5 Write message 5
MESSAGE6 Write message 6
MESSAGE7 Write message 7
MESSAGE8 Write message 8
SNAPSHOT Snapshot of the screen
MATHSTART/STOP Start/Stop MATH
MATHRESET Reset MATH
Query SU?
Example Set the key action to the snapshot of the screen.
SU SNAPSHOT

SK Sets the computation constant

Syntax SK p1,p2<terminator>
p1 Computation constant number (DX100P: K01 to K12, DX200P: K01 to K30)
p2 Constant (Up to 11 characters)
The range is –9.9999E+29 to –1.0000E–30, 0, and 1.0000E–30 to 9.9999E+29. (The + sign of "E+" can be omitted.)
The maximum number of significant digits is 5.
Query SK[p1]?
Example Set constant 1.0000E-10 for computation constant number K01.
SK K01,1.0000E-10
Description This command can be used on models with the computation function option /M1.

SI Sets the rolling average of the computation channel

When the rolling average of a computation channel is OFF

Syntax SI p1,p2<terminator>
p1 Computation channel number (DX100P: 31 to 42, DX200P: 31 to 60)
p2 Rolling average ON/OFF (OFF)
Query SI[p1]?
Example Turn OFF the rolling average of computation channel number 31.
SI 31,OFF

When the rolling average of a computation channel is ON

Syntax SI p1,p2,p3,p4<terminator>
p1 Computation channel number (DX100P: 31 to 42, DX200P: 31 to 60)
p2 Rolling average ON/OFF (ON)
p3 Sampling interval (1S, 2S, 3S, 4S, 5S, 6S, 10S, 12S, 15S, 20S, 30S, 1MIN, 2MIN, 3MIN, 4MIN, 5MIN, 6MIN, 10MIN, 12MIN, 15MIN, 20MIN, 30MIN, 1H)
p4 Number of samples (1 to 64)
Query SI[p1]?
Example Turn the rolling average of computation channel 31 ON, set the sampling interval to 1 minute, and the number of samples to 20.
SI 31,ON,1MIN,20
Description This command can be used on models with the computation function option /M1.

SJ Sets the TLOG timer

Syntax SJ p1,p2,p3<terminator>
p1 Computation channel number (DX100P: 31 to 42, DX200P: 31 to 60)
p2 Timer (1 to 3)
p3 Conversion of the time unit for TLOG.

```
                SUM computation
                OFF  No conversion.
                /S   Convert to a physical amount in
                     unit of seconds that are
                     integrated.
                /MIN Convert to a physical amount in
                     unit of minutes that are
                     integrated.
                /H   Convert to a physical amount in
                     unit of hours that are
                     integrated.
Query       SJ[ p1]?
Example     Set timer 1 to computation channel number
            31.  No conversion of time unit.
            SJ 31,1
```

Description
- This command can be used on models with the computation function option /M1.
- About p3
  In the sum computation, sampled data are summed over the scan interval. However, when a physical value is measured over a period of time, the actual value may not match the computed result. (This is due to the fact that the scan interval and the time unit are different.) In these cases, set p3 to the same unit as the time unit of the physical value.
  The summed value is calculated according to the following converting equation depending on the parameter.
  - OFF ∑(measured value)
  - /S ∑(measured value) x scan interval
  - /MIN ∑(measured value) x scan interval/60
  - /HOUR ∑(measured value) x scan interval/3600

  The scan interval unit is in seconds.

BD Sets the alarm delay time

```
Syntax      BD p1,p2<terminator>
            p1  Channel number (DX100P: 01 to 12 or
                31 to 42, DX200P: 01 to 60)
            p2  Alarm delay time (1 to 3600)[s]
Query       BD[ p1]?
Example     Set the alarm delay time for channel 01
            to 120 s.
            BD 01,120
```

BG Sets the message group

```
Syntax      BG p1,p2<terminator>
            p1  Message group number (1 to 7)
            p2  Group name (up to 16 characters)
Query       BG[ p1]?
Example     Set the group name of the message group 7
            to "Process2."
            BG 7,Process2
```

BL Sets use/not use the lot number and automatic increment of the lot number

```
Syntax      BL p1,p2<terminator>
            p1  Use/not use the lot number (USE, NOT)
            p2  Use/not use the auto increment of the
            lot number (ON, OFF)
Query       BL?
Example     Use the lot number and the auto increment
            of the lot number.
            BL USE,ON
```

Description Parameter p2 is valid when p1=USE.

BH Sets the batch header

```
Syntax      BH p1,p2<terminator>
            p1  Header number (1 to 3)
            p2  Character string (up to 64
            characters)
Query       BH[ p1]?
Example     Set "Manager A" to the header 1.
            BH 1,Manager A
```

EH Sets the calibration correction

Set the calibration correction in the following order. You must carry out the steps in order to set it correctly.

1. Set the number of break points (BEGIN).
2. Set the break points for the number of break points (SET).
3. Confirm the settings (END).

Set the number of break points

```
Syntax      EH p1,p2,p3<terminator>
            p1  Channel number (DX100P: 01 to 12,
            DX200P: 01 to 30)
            p2  Type of operation (BEGIN)
            p3  Number of break points (OFF, 2 to 16)
                OFF  Do not use the calibration
                     correction
```

Description
- This command is valid when the cal. correction setting (/CC1 option) is installed.
- When the input range setting (SR command) is set to SKIP, p3 cannot be set to a value in the range of 2 to 16..
- The cal. correction setting is turned OFF on the channel in the following cases.
  - The input type (mode) is changed.
  - The measurement range is changed.
  - Span, scale, or decimal point position is changed when the input type (mode) is scaling or square root computation.

Set the break points for the number of break points

```
Syntax      EH p1,p2,p3,p4,p5<terminator>
            p1  Channel number (DX100P: 01 to 12,
            DX200P: 01 to 30)
```

p2 Type of operation (SET)
p3 Break point number (1 to 16)
p4 Input value
p5 Output value

Description
- Set parameters p4 and p5 in the selectable range of values in the range specified for the channel. However, for channels set to scaling, set the value in the range of –30000 to 30000.
  In addition, set the decimal point position to match the notation of the channel.
- Set p4 so that the value increases as the p3 value increases.

Confirm the settings

Syntax EH p1,p2<terminator>
p1 Channel number (DX100P: 01 to 12, DX200P: 01 to 30)
p2 Type of operation (END)

Query EH p1?
"EH?" is not specified.
The confirmed settings are output to the query command.

Example Set the calibration correction with the three break points to Channel 2.

No. of B.P.	Inpur value	Output Value
1	0	1
2	50	49
3	100	101

```
EH 2,BEGIN,3
EH 2,SET,1,0,1
EH 2,SET,2,50,49
EH 2,SET,3,100,101
EH 2,END
```

RD Sets whether to use DST

Syntax RD p1<terminator>
p1 Use/Not use DST (USE, NOT)

Query RD?

Example Use DST.
RD USE

RT Sets the DST start/end time

Syntax RT p1,p2,p3,p4,p5,p6,p7,p8<terminator>
p1 DST start month (1 to 12)
p2 The number of the week in the month in which the DST start day falls (1 to 4, LAST)
p3 Day of the week when DST starts (SUN, MON, TUE, WED, THU, FRI, SAT)
p4 DST start hour (0 to 23)
p5 DST end month (1 to 12)
p6 The number of the week in the month in which the DST end day falls (1 to 4, LAST)
p7 Day of the week when DST ends (SUN, MON, TUE, WED, THU, FRI, SAT)
p8 DST end hour (0 to 23)

Query RT?

Example Set the DST start time to "0 hour on the 2nd Sunday in June" and the DST end time to "0 hour on the 2nd Sunday in December."
RT 6,2,SUN,0,12,2,SUN,0

Description The start time and end time cannot be set to the same value.

5.5 Setting Commands (System Mode)

XA Sets alarm related settings

Syntax XA p1,p2,p3,p4,p5,p6,p7,p8<terminator>
p1 Turn ON/OFF reflash (ON, OFF)
p2 Relay number set to AND logic (NONE, I01, I01-Ixx)
Ixx: I02 to I06
I11 to I16 (only for DX200P)
I21 to I26 (only for DX200P)
I31 to I26 (only for DX200P)
p3 Energize/De-energize the relay (ENERGIZE, DE_ENERGIZE)
p4 Hold/Not hold the relay (HOLD, NONHOLD)
p5 Hold/Not hold the alarm status display (HOLD, NONHOLD)
p6 Interval for the upper limit on the rate-of-change (1 to 15)
p7 Interval for the lower limit on the rate-of-change (1 to 15)
p8 Turn ON/OFF the alarm hysteresis (ON, OFF).

Query XA?

Example Set relay numbers I01 to I12 to AND logic. Enable reflash. Set the alarm to energizing and hold. Set the alarm status display to hold. Set the interval for the upper limit on the rate-of-change to 10 and the interval for the lower limit on the rate-of-change to 12. Enable alarm hysteresis.
XA ON,I01-I12,ENERGIZE,HOLD,HOLD,10,12,ON

Description
- The interval is set in units of the scan interval. The XV command is used to set the scan interval.
- The hysteresis setting does not apply to computation channels.

XI Sets the A/D integral time

Syntax XI p1<terminator>
p1 A/D integral time (AUTO, 50HZ, 60HZ, 100MS)

Query XI?

Example Set the A/D integral time to 50 Hz.
XI 50HZ

Description 100 MS is available only on models DX106P, DX112P, DX210P, DX220P, and DX230P.

XB Sets the burn out

Syntax XB p1,p2<terminator>
p1 Channel number (DX100P: 01 to 12, DX200P: 01 to 30)
p2 Burn out procedure (OFF, UP, DOWN)

Query XB[p1]?

Example Set to UP (+ overflow) when channel 01 burns out.
XB 01,UP

XJ Sets the RJC

When using the internal compensation circuit

Syntax XJ p1,p2<terminator>
p1 Channel number (DX100P: 01 to 12, DX200P: 01 to 30)
p2 Reference junction compensation selection (INTERNAL)

Query XJ[p1]?

Example Set the RJC of channel 01 to the internal compensation circuit.
XJ 01,INTERNAL

When using an external RJC

Syntax XJ p1,p2,p3<terminator>
p1 Channel number (DX100P: 01 to 12, DX200P: 01 to 30)
p2 Reference junction compensation selection (EXTERNAL)
p3 External RJC value (–20000 to 20000)

Query XJ[p1]?

Example Set the reference junction compensation of channel 02 to external and set the compensation value to 0 μV.
XJ 02,EXTERNAL,0

Description The unit of p3 is μV.

XV Sets the scan interval

Syntax XV p1<terminator>
p1 Scan interval
Select from 125MS or 250MS on models DX102P, DX104P, DX204P, and DX208P.
Select from 1S or 2S on models DX106P, DX112P, DX210P, DX220P, and DX230P.

Query XV?

Example Set the scan interval to 1s.
XV 1S

Description When the A/D integration time (p1 of XI command) is set to 100 MS on models DX106P, DX112P, DX210P, DX220P, and DX230P, the scan interval can only be set to 2 s.

BI Sets the application

Syntax BI p1,p2<terminator>
p1 Process type (BATCH, CONTINUE)
p2 Whether or not to clears the waveform display when starting measurement (ON, OFF)

Query BI?

Example Set BATCH to the process type, and clear the waveform display when starting measurement.

```
BI BATCH,ON
```

XT Selects the temperature unit

Syntax
```
XT p1<terminator>
p1  Temperature unit
    C   Celsius (°C)
    F   Fahrenheit (°F)
```
Query
```
XT?
```
Example
```
Set the temperature unit to Fahrenheit.
XT F
```
Description This command can be used on models with the display language code "-2".

XS Sets the channels to display the trend and acquire the data

Syntax
```
XS p1,p2<terminator>
p1  Channel number (DX100P: 01 to 12 or
    31 to 42, DX200P: 01 to 60)
p2  Enable/disable (ON, OFF) displaying
    the trend and acquiring the data
```
Query
```
XS[ p1]?
```
Example
```
Enable displaying the trend and acquiring
the data on channel 01.
XS 01,ON
```
Description Computation channels (DX100P: 31 to 42, DX200P: 31 to 60) can be configured on products with the computation function option / M1.

XM Sets the conditions used to acquire display/event data to the internal memory or save the data to the external storage medium

Syntax
```
XM p1,p2,p3<terminator>
p1  Data type (DISPLAY, EVENT)
p2  Sample rate of event data (125MS,
    250MS, 500MS, 1S, 2S, 10S, 30S, 60S,
    120S, 300S, 600S)
p3  Event data length (3MIN, 5MIN, 10MIN,
    20MIN, 30MIN, 1H, 2H, 3H, 4H, 6H, 8H,
    12H, 1DAY, 2DAY, 3DAY, 5DAY, 7DAY,
    10DAY, 14DAY, 31DAY)
```
Query
```
XM?
```
Example
```
Set the data types to event data, the
sample rate to 10 s, and the event data
length to 30 minutes.
XM EVENT,10S,30MIN
```
Description
- Parameters p2 and p3 are valid when p1 is set to EVENT.
- Parameter p2 can be set to 125MS, 250MS, or 500MS on models DX102P, DX104P, DX204P, or DX208P.
- The event data length selection (p3) varies depending on the p2 setting and the number of channels that are measuring and computing. For details, see the DX100P/DX200P User's Manual.
- When the application setting (BI command) is "Batch," the data length is fixed to an available maximum value. parameter p3 cannot be set arbitrarily.

XU Sets the channel identification display, memory alarm time, language, whether or not to use the partial expanded display function, and the Remote Controller ID

Syntax
```
XU p1,p2,p3,p4,p5<terminator>
p1  The display used to identify the
    measurement/computation channels
    (TAG, CHANNEL)
p2  Memory alarm time (1H, 2H, 5H, 10H,
    20H, 50H, 100H)
p3  Language (ENGLISH, JAPANESE, GERMAN,
    FRENCH)
p4  Use/Not use partial expanded display
    function (USE, NOT)
p5  Remote controller ID (0 to 31)
```
Query
```
XU?
```
Example
```
Set the display used to identify the
measurement/computation channels to
channel numbers, the memory alarm length
to 1 hour, the language to English, use
the partial expansion function, and the
remote controller ID to "5."
XU CHANNEL,1H,ENGLISH,USE,5
```
Description
- The SP command cannot be specified unless the partial expanded display function (p4) of the XU command is set to USE.
- Parameter p5 (remote controller ID) is valid on models with the easy text entry option, /KB1 or /KB2.

XR Sets the remote action

Syntax
```
XR p1,p2<terminator>
p1  Remote number (1 to 8)
p2  Remote action
    NONE        No action
    ALARMACK    Alarm acknowledge
    MEMORYSTART/STOP
                Start/stop measurement
    MANUALSAMPLE
                Manual sampling
    MESSAGE1    Write message 1
    MESSAGE2    Write message 2
    MESSAGE3    Write message 3
    MESSAGE4    Write message 4
    MESSAGE5    Write message 5
```

```
                MESSAGE6   Write message 6
                MESSAGE7   Write message 7
                MESSAGE8   Write message 8
                MATHSTART/STOP
                           Start/stop MATH
                MATHRESET  Reset MATH
                TIMEADJUST Adjust time
                SNAPSHOT   Snapshot
Query      XR[ p1]?
Example    Set the remote action of remote terminal
           1 to a manual sampling.
           XR 1,MANUALSAMPLE
```

XQ Sets the timer.

When not using the timer

```
Syntax     XQ p1,p2<terminator>
           p1  Timer number (1 to 3)
           p2  Timer type (OFF)
Query      XQ[ p1]?
Example    Turn the number 1 timer OFF.
           XQ 1,OFF
```

Description This command can be used on models with the computation function option /M1.

When using the absolute timer

```
Syntax     XQ p1,p2,p3,p4,p5,p6<terminator>
           p1  Timer number (1 to 3)
           p2  Timer type (ABSOLUTE)
           p3  Interval (1MIN, 2MIN, 3MIN, 4MIN,
               5MIN, 6MIN, 10MIN, 12MIN, 15MIN,
               20MIN, 30MIN, 1H, 2H, 3H, 4H, 6H, 8H,
               12H, 24H)
           p4  Reference Time (hh fixed form)
               hh    Hour (00 to 23)
           p5  Reset/not reset the integrated value
               when the timer expires. (ON/OFF)
           p6  Action to take when the timer expires
               (OFF, DATA SAVE)
Query      XQ[ p1]?
Example    Set an absolute timer to timer number 1.
           Set the sampling interval to 30 minutes,
           the reference time to 7 O'clock, reset
           the integrated value when the timer
           expires, and set no action when the timer
           expires.
           XQ 1,ABSOLUTE,30MIN,07,ON,OFF
```

Description
- This command can be used on models with the computation function option /M1.
- The timer expires at the interval specified by parameter 3 from the time specified by p4, and performs the operation set with parameters p5 and p6.

When using the relative timer

```
Syntax     XQ p1,p2,p3,p4,p5<terminator>
           p1  Timer number (1 to 3)
           p2  Timer type (RELATIVE)
           p3  Interval (hh:mm fixed form)
               hh    Hour (00 to 24)
               mm    Minute (00 to 59)
               Set in the range 00:01 to 24:00
           p4  Reset/not reset the integrated value
               when the timer expires. (ON/OFF)
           p5  Action to take when the timer expires
               (OFF, DATA SAVE)
Query      XQ[ p1]?
Example    Set a relative timer to timer number 1.
           Set the sampling interval to 1 hour 15
           minutes, reset the integrated value when
           the timer expires, and set no action when
           the timer expires.
           XQ 1,RELATIVE,01:15,ON,OFF
```

Description
- This command can be used on models with the computation function option /M1.
- The timer expires at the interval specified by parameter p3 from the time the computation is started, and performs the operation set with parameters p4 and p5.

RO Sets the report type and generation time.

When report type is set to none

```
Syntax     RO p1<terminator>
           p1  Report type (OFF)
Query      RO?
Example    Set report to none.
           RO OFF
```

Description This command can be used on models with the computation function option /M1.

For hourly, daily, and daily + monthly reports

```
Syntax     RO p1,p2,p3<terminator>
           p1  Report type (HOUR, DAY, DAY+MONTH)
           p2  Date of creation (dd fixed form)
               dd    Day (01 to 28)
           p3  Time of creation (h h fixed form)
               hh    hour (00 to 23)
Query      RO?
Example    Create a daily report at 9 o'clock
           everyday (Parameter p2 is invalid in this
           example).
           RO DAY,05,09
```

Description This command can be used on models with the computation function option /M1.

For daily+weekly reports

```
Syntax     RO p1,p2,p3<terminator>
           p1  Report type (DAY+WEEK)
           p2  Day of creation (SUN, MON, TUE, WED,
               THU, FRI, SAT)
           p3  Time of creation (hh fixed form)
               hh    hour (00 to 23)
Query      RO?
```

Example Create a daily report at 9 o'clock everyday, and a weekly report every Tuesday.
RO DAY+WEEK,TUE,09

Description This command can be used on models with the computation function option /M1.

RM Sets the report channel

When not using the report channel

Syntax RM p1,p2<terminator>
p1 Report channel number (DX100P: 01 to 12, DX200P: 01 to 30)
p2 Use/Not use the report channel (OFF)

Query RM[p1]?

Example Set the report channel of number 1 to unused.
RM 01,OFF

Description This command can be used on models with the computation function option /M1.

When using the report channel

Syntax RM p1,p2,p3,p4<terminator>
p1 Report channel number (DX100P: 01 to 12, DX200P: 01 to 30)
p2 Use/Not use the report channel (ON)
p3 The measurement/computation channel number for which to create reports (DX100P: 01 to 12 or 31 to 42, DX200P: 01 to 30)
p4 Summation conversion of the waveform on which integration is to be performed.
OFF no conversion
/S Convert as though the physical values are integrated in units of seconds.
/MIN Convert as though the physical values are integrated in units of minutes.
/H Convert as though the physical values are integrated in units of hours.
/DAY Convert as though the physical values are integrated in units of days.

Query RM[p1]?

Example Use the report channel number 1. Set the measurement/computation channel number for which to create reports to 01, and the summation conversion of the waveform on which integration is to be performed to 1 s.
RM 01,ON,01,/S

Description
- This command can be used on models with the computation function option /M1.
- About p4
  Because the sampled data are integrated over each scan interval, the physical value integrated over a given period of time may be different from the actual integrated value. This occurs if the given period is not equal to the scan interval. In these cases, set p4 to the unit of the integration time desired. The integrated value is found according to the following conversion equations that depend on the p4 parameter.
  OFF ∑(Measured value)
  /S ∑(Measured value) × scan interval
  /MIN ∑(Measured value) × scan interval/60
  /HOUR ∑(Measured value) × scan interval/3600
  /DAY ∑(Measured value) × scan interval/86400
  The unit of the scan interval is seconds.

XO Selects the communication interface used to output files on the external storage medium using ME command

Syntax XO p1<terminator>
p1 Communication type
ETHERNET Ethernet communications
SERIAL Serial communications

Query XO?

Example Set the communication interface to Ethernet (the communication interface is used to output files on the external storage medium using the ME command).
XO ETHERNET

Description The p1 parameter can be set on models with the serial interface (/C2 or /C3 option).

XG Sets the time zone

Syntax XG p1<terminator>
p1 The offset time from GMT (-1200 to 1200)
Upper two digits Hours (00 to 12)
Lower two digits Minutes (00 to 59)

Query XG?

Example Set the offset time to 9 hours lead.
XG 0900

XP Sets the data and time for the memory timeup

When the memory timeup is set to none

Syntax XP p1<terminator>
p1 Timeup type (OFF)

Query XP?

Example Set the memory timeup to none.

```
          XP OFF
```

When the timeup type is set to “HOUR”

```
Syntax    XP p1<terminator>
          p1  Timeup type (HOUR)
          p2  Date of timeup (dd fixed form)
              dd   Day (01 to 28)
          p3  Time of timeup (hh fixed form)
              hh   hour (00 to 23)
Query     XP?
Example   The memory timeup occurs every hour on
          the hour.
          XP HOUR
```

When the timeup type is set to “DAY” or “MONTH”

```
Syntax    XP p1,p2,p3<terminator>
          p1  Timeup type (DAY, MONTH)
          p2  Date of timeup (dd fixed form)
              dd   Day (01 to 28)
          p3  Time of timeup (hh fixed form)
              hh   hour (00 to 23)
Query     XP?
Example   The memory timeup occurs at 9 o'clock
          everyday (Parameter p2 is invalid in this
          example).
          XP DAY,05,09
```

When the timeup type is set to “WEEK”

```
Syntax    XP p1,p2,p3<terminator>
          p1  Timeup type (WEEK)
          p2  Day of timeup (SUN, MON, TUE, WED,
              THU, FRI, SAT)
          p3  Time of timeup (hh fixed form)
              hh   hour (00 to 23)
Query     XP?
Example   The memory timeup occurs at 9 o'clock
          every Tuesday.
          XP WEEK,TUE,09
```

BR Sets the system relays

```
Syntax    BR p1,p2<terminator>
          p1  System relay number (1, 2)
          p2  Action
              FAIL       Outputs CPU failure
              MemoryEnd  Outputs memory end alarm
              BatchStart/Stop
                         Outputs Memory Start/Stop
              UserLocked Outputs the occurrence of
                         a user locked condition
              Login      Outputs the presence of a
                         logged-in user
Query     BR[ p1]?
Example   Set the memory end alarm optput to the
          system relay 1.
          BR 1, MemoryEnd
```

Description This command can be used on models with the FAIL/memory end option /F1.

YA Sets the IP address, subnet mask, and default gateway

```
Syntax    YA p1,p2,p3<terminator>
          p1  IP address (0.0.0.0 to
              255.255.255.255)
          p2  Subnet mask
              (0.0.0.0 to 255.255.255.255)
          p3  Default gateway
              (0.0.0.0 to 255.255.255.255)
Query     YA?
Example   Set the IP address to 192.168.111.24,
          subnet mask to 255.255.255.0, and default
          gateway to 0.0.0.0.
          YA 192.168.111.24,255.255.255.0,0.0.0.0
```

YK Sets keepalive

```
Syntax    YK p1<terminator>
          p1  Enable/Disable keepalive (ON, OFF)
Query     YK?
Example   Disable keepalive
          YK OFF
```

YN Sets the DNS.

When not using the DNS

```
Syntax    YN p1<terminator>
          p1  Use/Not use the DNS (OFF)
Query     YN?
Example   Do not use the DNS.
          YN OFF
```

When using the DNS

```
Syntax    YN p1,p2,p3,p4,p5,p6,p7<terminator>
          p1  Use/Not use the DNS (ON)
          p2  Address of the primary DNS server
              (0.0.0.0 to 255.255.255.255)
          p3  Address of the secondary DNS server
              (0.0.0.0 to 255.255.255.255)
          p4  Host name (Up to 64 characters)
          p5  Domain name (Up to 64 characters)
          p6  Domain suffix 1 (Up to 64 characters)
          p7  Domain suffix 2 (Up to 64 characters)
Query     YN?
Example   Use the DNS server at 192.168.0.1.
          YN 192.168.0.1
```

YQ Sets the communication timeout

When not using the timeout

```
Syntax    YQ p1<terminator>
          p1  Enable/Disable communication timeout
              (OFF)
Query     YQ?
Example   Disable timeout.
          YQ OFF
```

When using the timeout

```
Syntax    YQ p1,p2<terminator>
```

p1 Enable/Disable communication timeout (ON)
p2 Timeout time (1 to 120) [minutes]

Query YQ?

Example Enable communication timeout and set the timeout period to 3 min.
YQ ON,3

EQ Sets the user that can use the communication input data

Syntax EQ p1<terminator>

p1 User that can use the communication input data

OFF	No user can use the communication input data
Admin1 to 3	Administrators on the Ethernet communications
User1 to 30	Users on the Ethernet communications
Serial	User on the serial communications

Query EQ?

Example Set the administrator 1 as the user that can use the communication input data.
EQ Admin1

Description
- This command can specify a single user.
- If no administrators are registered, specifying any user from “Admin1” to “User30” is equivalent to specifying the user connected to the setting/measurement server using the Setting function.
- “Serial” is valid on products with serial communications option, /C2 or /C3.

YS Sets the serial interface

Syntax YS p1,p2,p3,p4,p5,p6<terminator>

p1 Baud rate (1200, 2400, 4800, 9600, 19200, 38400)
p2 Data length (7, 8)
p3 Parity check (NONE, ODD, EVEN)
p4 Handshaking (OFF:OFF, XON:XON, XON:RS, CS:RS)
p5 RS-422A/485 address (01 to 32)
p6 Protocol (OFF, NORMAL, MODBUS, MODBUS-M, BARCODE)

Query YS?

Example Set the baud rate to 9600, the data length to 8, the parity check to ODD, handshaking to OFF:OFF, the RS-422A/485 address to 02, and the protocol to NORMAL.
YS 9600,8,ODD,OFF:OFF,02,NORMAL

Description This command can be used on models with the serial interface option /C2 or /C3.

YT Sets the files to be transferred using FTP client

Syntax YT p1,p2,p3<terminator>

p1 Transfer display and event data files. Transfer setup file/setting change log file (ON, OFF)
p2 Transfer report data files (ON, OFF)
p3 Transfer screen image data files by snapshot operation (ON, OFF)

Query YT?

Example Transfer the display and event data files. Do not transfer the report data file and screen image data file.
YT ON,OFF,OFF

YG Sets whether or not to use the Web server

Syntax YO p1<terminator>

p1 Use/Not Web server (USE, NOT)

Query YG?

Example Use Web server.
YG USE

YL Sets the Modbus master

Syntax YL p1,p2,p3<terminator>

p1 Read cycle (125MS, 250MS, 500MS, 1S, 2S, 5S, 10S)
p2 Timeout time (125MS, 250MS, 500MS, 1S, 2S, 5S, 10S, 1MIN)
p3 Number of retrials (OFF, 1, 2, 3, 4, 5, 10, 20)

Query YL?

Example Set the read cycle to 500MS, timeout time to 250MS, and number of retrials to 2.
Yl 500MS,250MS,2

YM Sets the commands for Modbus master

When the command is not used

Syntax YM p1,p2<terminator>

p1 Registration number (1 to 8)
p2 Command ON/OFF (OFF)

Query YM[p1]?

Example Set the command registration number 1 to OFF.
YM 1,OFF

When the command is used

Syntax YS p1,p2,p3,p4,p5,p6,p7<terminator>

p1 Registration number (1 to 8)
p2 Command ON/OFF (ON)
p3 First channel number (DX100P: C01 to C12, DX200P: C01 to C30)
p4 Last channel number (DX100P: C01 to C12, DX200P: C01 to C30)

p5 Slave device address number (1 to 247)
p6 Register number (30001 to 39999, 40001 to 49999, 300001 to 365535, 400001 to 465535)
p7 Data type (INT16, UINT16, INT32_B, INT32_L, UINT32_B, UINT32_L, FLOAT_B, FLOAT_L)

Query YM[p1]?

Example Take a 32-bit signed integer assigned to registers 30003 (upper 16 bits) and 30004 (lower 16 bits) in slave device (address number is 5) to the communication input data channel C02.
YM 2,ON,C02,C02,5,30003,INT32_B

YU Sets the contents of the e-mail

When setting the alarm mail

Syntax YU p1,p2,p3,p4,p5,p6,p7,p8,p9,p10,p11,p12<terminator>
p1 Type (ALARM)
p2 Recipient 1 (ON, OFF)
p3 Recipient 2 (ON, OFF)
p4 Alarm No.1 (ON, OFF)
p5 Alarm No.2 (ON, OFF)
p6 Alarm No.3 (ON, OFF)
p7 Alarm No.4 (ON, OFF)
p8 Instantaneous values (ON, OFF)
p9 URL of the DXP (ON, OFF)
p10 Subject (Up to 32 characters)
p11 Header 1 (Up to 64 characters)
p12 Header 2 (Up to 64 characters)

Query YU[p1]?

Example Send alarm mails from alarm no. 1 to 4, to the recipient 1. Attach the instantaneous values but the URL. Set the subject and the header 1 to "ALM" and "LP2" respectively.
YU ALARM,ON,OFF,ON,ON,ON,ON,ON,OFF,ALM,LP2

When setting the scheduled mail

Syntax YU p1,p2,p3,p4,p5,p6,p7,p8,p9,p10,p11,p12<terminator>
p1 Type (TIME)
p2 Recipient 1 (ON, OFF)
p3 Interval for recipient 1 (1H, 2H, 3H, 4H, 6H, 8H, 12H, 24H)
p4 Time to send mail to recipient 1 (HH:MM)
p5 Recipient 2 (ON, OFF)
p6 Interval for recipient 2 (1H, 2H, 3H, 4H, 6H, 8H, 12H, 24H)
p7 Time to send mail to recipient 2 (HH:MM)
p8 Instantaneous values (ON, OFF)
p9 URL of the DXP (ON, OFF)
p10 Subject (Up to 32 characters)
p11 Header 1 (Up to 64 characters)
p12 Header 2 (Up to 64 characters)

Query YU[p1]?

Example Send scheduled mails to the recipient 1 at 17:15 everyday. Do not attach the instantaneous values. Attach the URL. Set the subject and the header 1 to "GOOD" and "LP2" respectively.
YU TIME,ON,24H,17:15,OFF,,,OFF,ON,GOOD,LP2

When setting the system mail

Syntax YU p1,p2,p3,p4,p5,p6,p7<terminator>
p1 Type (SYSTEM)
p2 Recipient 1 (ON, OFF)
p3 Recipient 2 (ON, OFF)
p4 URL of the DXP (ON, OFF)
p5 Subject (Up to 32 characters)
p6 Header 1 (Up to 64 characters)
p7 Header 2 (Up to 64 characters)

Query YU[p1]?

Example Send system mails to the recipient 1 with the URL of the DXP attached. Set the subject and the header 1 to "SystemAlart" and "LP2" respectively.
YU SYSTEM,ON,OFF,ON,SystemAlart,LP2

When setting the report mail

Syntax YU p1,p2,p3,p4,p5,p6,p7<terminator>
p1 Type (REPORT)
p2 Recipient 1 (ON, OFF)
p3 Recipient 2 (ON, OFF)
p4 URL of the DXP (ON, OFF)
p5 Subject (Up to 32 characters)
p6 Header 1 (Up to 64 characters)
p7 Header 2 (Up to 64 characters)

Query YU[p1]?

Example Send report mails to the recipient 1 with the URL of the DXP attached. Set the subject and the header 1 to "Report" and "LP2" respectively.
YU REPORT,ON,OFF,ON,Report,LP2

Description
- For details on the system mail, see section 1.1.
- The report mail can be used on models with the computation function option /M1.

YV Sets the recipient's address

Syntax YV p1,p2<terminator>
p1 Recipient
1 Recipient 1
2 Recipient 2
p2 Addresses (Up to 150 characters)

Query YV[p1]?

Example Set the addresses for the recipient 1 to "Cont@good.co.jp" and "Adm@good.co.jp."
YV 1,Cont@good.co.jp Adm@good.co.jp

Description To specify multiple addresses, delimit the addresses using spaces.

YW Sets the sender's address

Syntax YW p1<terminator>
p1 Sender's address (Up to 64 characters)

Query YW?

Example Set the sender's addresses to "DX210P."
YW DX210P

YX Sets the SMTP server

Syntax YX p1,p2<terminator>
p1 SMTP server's name (Up to 64 characters)
p2 Port number (0 to 65535)

Query YX?

Example Set the SMTP server's name to "mhs.good.co.jp" and the port number to "25."
YX 1,mhs.good.co.jp,25

EF Sets the FTP client

Syntax EF p1,p2,p3,p4,p5,p6,p7,p8<terminator>
p1 Priority (PRIMARY, SECONDARY)
p2 FTP server name (up to 64 characters)
p3 Port No. (0 to 65535)
p4 Login name (up to 32 characters)
p5 Password (up to 32 characters)
p6 Account (up to 32 characters)
p7 Use/not use PASV (PRIMARY, SECONDARY)
p8 Initial path (up to 64 characters)

Query EF[p1]?
Only an administrator can use the query.

Example Set the connection to the primary server "SS." Login name, password, account, port number, and initial path are "ABC," "AAAAAAAA," "super," "21," and "/home/data" respectively.
EF PRIMARY,SS,21,ABC,AAAAAAAA,super,OFF,/home/data

EG Sets the Web server

Syntax EG p1,p2,p3,p4,p5<terminator>
p1 Page type (OPERATOR, MONITOR)
p2 Use/not use the page (ON, OFF)
p3 Use/not use access control (ON, OFF)
p4 User name (up to 20 characters)
p5 Password (up to 8 characters)

Query EG[p1]?
Only an administrator can use the query.

Example Use the operator page. User name and password for access control are "ABC2001" and "AAAAAAAA" respectively.
EG OPERATOR,ON,ON,ABC2001,AAAAAAAA

RG Sets the time deviation limit

Syntax RG p1<terminator>
p1 Time deviation limit (OFF, 10s, 20s, 30s, 1min, 2min, 3min, 4min, 5min)

Query RG?

Example When the time deviation between the specified time and the time on the DXP is within ±10 s, gradually adjust the DXP time.
RG 10s

XC Sets the cyclical use of the storage area of the external storage medium (Media FIFO)

Syntax XC p1<terminator>
p1 Cyclical use of the storage area of the external storage medium (ON, OFF)

Query XC?

Example Use the storage area of the external storage medium cyclically.
XC ON

RC Enables/Disables setting changes when data acquisition is in progress

Syntax RC p1,p2,p3,p4<terminator>
p1 Time adjustment (ON, OFF)
p2 User registration setting (ON, OFF)
p3 Calibration correction (ON, OFF)
p4 Auto message writing during calibration correction setting change (ON, OFF)

Query RC?

Example Enable all.
RC ON,ON,ON,ON

Description
- Parameters p3 and p4 are valid when the calibration correction (/CC1 option) is installed.
- The setting of p4 is valid when p3 is ON.

WA Sets the SNTP server

Syntax WA p1<terminator>
p1 Use/not use the SNTP server function (USE, NOT)

Query WA?

Example Use the SNTP server function.
WA USE

WB Sets the SNTP client

Syntax WB p1,p2,p3,p4,p5,p6<terminator>
p1 Use/not use the SNTP client function (USE, NOT)
p2 SNTP server name (up to 64 characters)
p3 SNTP port number (0 to 65535)
p4 Access interval (OFF, 1h, 8h, 12h, 24h)
p5 Access reference time (00:00 to 23:59)
p6 Access timeout (10s, 30s, 90s)

Query WB?

Example Retrieve time information SNTP server ABC at hour 0 every day. Set the server port to 123 and access timeout to 10 s.
WB ON,ABC,123,24h,00:00,10s

Description Parameter p2 to p6 are valid when p1 is set to USE.

WC Sets the SNTP client function when data acquisition is in progress

Syntax WC p1<terminator>
p1 Time adjustment when data acquisition is in progress (ON, OFF)

Query WC?

Example Retrieve time information from an SNTP server when data acquisition is in progress and adjust the time.
WC ON

BN Sets the login function

Syntax BN p1,p2<terminator>
p1 Use/not use the user ID to login (USE, NOT)
p2 Auto logout (OFF, 1MIN, 2MIN, 5MIN, 10MIN)
OFF Do not use auto logout
p3 Screen change when logged out (ON, OFF)

Query BN?

Example Use the user ID when logging in and set the auto logout time to 5 minutes. Change the screen when logged out.
BN USE,5MIN,ON

BS Sets the electronic signature function

Syntax BS p1,p2,p3<terminator>
p1 Use/not use the electronic signature function (USE, NOT)
p2 Whether or not to sign the data at Memory Stop (ON, OFF)
p3 Use/not use the user ID to apply electronic signature (USE, NOT)

Query BS?

Example Use electronic signature function, user ID to apply electronic signature. Switch the screen to the sign record display at Memory Stop.
BS USE,ON,USE

Description Parameters p2 and p3 are valid when p1=USE.

EK Sets administrators

When using the user ID

Syntax EK p1,p2,p3,p4,p5,p6<terminator>
p1 Registration No. (1 to 3)
p2 Login method
OFF Disabled
KEY Key operation
KEY+COM Key operation and via Ethernet
p3 User name (up to 20 characters)
p4 User ID (up to 8 characters)
p5 Password (arbitrary characters)
p6 Password expiration time (OFF, 1Month, 3Month, 6Month)

Query EK[p1]?
Only an administrator can use the query.

Example Set login method, user name, user ID, and password expiration time to KEY+COM, “ABC,” “5555,” and 3 months respectively for administrator 1.
EK 1,KEY+COM,ABC,5555,*,3Month

When not using the user ID

Syntax EK p1,p2,p3,p4,p5<terminator>
p1 Registration No. (1 to 3)
p2 Login method
OFF Disabled
KEY Key operation
KEY+COM Key operation and via Ethernet
p3 User name (up to 20 characters)
p4 Password (arbitrary characters)
p5 Password expiration time (OFF, 1Month, 3Month, 6Month)

Query EK[p1]?
Only an administrator can use the query.

Example Set login method, user name, and password expiration time to KEY, “EFG,” and a month respectively for administrator 2.
EG 2,KEY,EFG,*,1Month

Description
- You cannot specify “quit” as a user name. A space or spaces are not allowed.
- If this command is executed, the password is reset to its default.
- The response to query command is,
  ********: Valid password
  --------: Invalidated password

EL Sets users

When using the user ID

Syntax EL p1,p2,p3,p4,p5,p6,p7<terminator>
p1 Registration No. (1 to 90)
p2 Login method
OFF Disabled
KEY Key operation
COM via Ethernet
KEY+COM Key operation and via Ethernet
p3 User name (up to 20 characters)
p4 User ID (up to 8 characters)
p5 Password (arbitrary characters)
p6 Password expiration time (OFF, 1Month, 3Month, 6Month)
p7 Login mode number (1 to 30)

Query EL[p1]?
Only an administrator can use the query.

Example Set login method, user name, user ID, password expiration time, and login mode number to KEY+COM, "ope1," "7777," 3 months, and "3" respectively for user 1.
EL 1,KEY+COM,ope1,7777,*,3Month,3

When not using the user ID

Syntax EG p1,p2,p3,p4,p5,p6<terminator>
p1 Registration No. (1 to 90)
p2 Login method
OFF Disabled
KEY Key operation
COM via Ethernet
KEY+COM Key operation and via Ethernet
p3 User name (up to 20 characters)
p4 Password (arbitrary characters)
p5 Password expiration time (OFF, 1Month, 3Month, 6Month)
p6 Login mode number (1 to 30)

Query EL[p1]?
Only an administrator can use the query.

Example Set login method, user name, user ID, password expiration time, and login mode number to KEY, "ope2," "7777," a months, and "4" respectively for user 2.
EG 2,KEY,ope2,*,1Month,4

Description
- This command can be used when at least an administrator is registered.
- You cannot specify "quit" as a user name. A space or spaces are not allowed.
- If this command is executed, the password is reset to its default.
- The response to query command is,
  ********: Valid password
  --------: Invalidated password
- Parameters p3 to p7 are valid when p2 is not OFF.

BW Sets the login mode: sign authority level

Syntax BW p1,p2<terminator>
p1 Login mode number (1 to 30)
p2 Sign authority level (OFF, SIGNATURE1, SIGNATURE2, SIGNATURE3)

Query BW[p1]?

Example Set the sign authority level for the login mode 1 to "SIGNATURE1."
BW 1,SIGNATURE1

BK Sets the login mode: key operations

Syntax BK p1,p2,p3,p4,p5,p6<terminator>
p1 Login mode No. (1 to 30)
p2 START key (FREE, LOCK)
p3 STOP key (FREE, LOCK)
p4 MENU key (FREE, LOCK)
p5 USER key (FREE, LOCK)
p6 DISP/ENTER key (FREE, LOCK)

Query BK[p1]?

Example Set FREE to keys other than MENU key for login mode 1.
EG 1,FREE,FREE,LOCK,FREE,FREE

BM Sets the login mode: alarm ACK and removal of Zip disk

Syntax BM p1,p2,p3<terminator>
p1 Login mode No. (1 to 30)
p2 Alarm ACK (FREE, LOCK)
p3 Removal of Zip disk (FREE, LOCK)

Query BM[p1]?

Example Set FREE to both operations for login mode 1.
EG 1,FREE,FREE

BF Sets the login mode: FUNC key operations, etc.

Syntax BF p1,p2,p3,p4,p5,p6,p7,p8,p9<terminator>
p1 Login mode No. (1 to 30)
p2 Batch (FREE, LOCK)
p3 Message (FREE, LOCK)
p4 Snapshot (FREE, LOCK)
p5 Math (FREE, LOCK)
p6 Data save (FREE, LOCK)
p7 Data load (FREE, LOCK)
p8 E-mail (FREE, LOCK)
p9 Others (FREE, LOCK)

Query BF[p1]

Example Set FREE to operations other than "E-mail" for login mode 1.
BF 1,FREE,FREE,FREE,FREE,FREE,FREE,LOCK,FREE

EI Sets whether or not to use the setting of calibration correction and measuring range

```
Syntax      EI p1,p2<terminator>
            p1  User registration number (1 to 90)
            p2  whether or not to use the setting of
                calibration correction and measuring
                range (USE, NOT)
Query       EI[ p1]
Example     Allow user 1 to change the calibration
            correction settings.
            EI 1,USE
```

Description
- This command can be used on models with the calibration correction option /CC1.
- This command can be used when a user is valid (login type is not OFF).

5.6 Control Commands

CC Disconnects an Ethernet connection

```
Syntax      CC p1<terminator>
            p1  Disconnect the connection (0)
Example     Disconnect the connection.
            CC 0
```

Description
- This command can be used only during Ethernet communications.
- When this command is executed, you are logged out.

FR Sets the acquiring interval to the FIFO buffer

```
Syntax      FR p1<terminator>
            p1  FIFO acquiring interval (125MS,
                250MS, 500MS, 1S, 2S)
Query       FR?
Example     Set the FIFO acquiring interval to 1 s.
            FR 1S
```

Description
- 125 MS, 250 MS, and 500 MS apply only to models DX102P, DX104P, DX204P, and DX208P.
- Set the acquiring interval to a value greater than the scan interval.
- If the scan interval is set to a value less than the acquiring interval using the XV command or from the screen, the acquiring interval is automatically set equal to the scan interval.
- The DXP has a circular FIFO buffer. The measured/computed values are acquired to the internal memory at predetermined time intervals from the time the power is turned ON, and the data are output when a FF command is received. The previous output position is held for each connection and is updated when the next set of data is output with the FF command. Using this functionality, data can be collected without data dropouts if the PC reads the data in the circular buffer before the data are overacquired. This compensates for the communication time differences that result from periodically retrieving data from the DXP at a rate determined by the processing power of the measurement PC. For the output flow of FIFO data, see appendix 4.

EE Switches the mode from the operation mode

```
Syntax      EE p1<terminator>
            p1  Mode
                ENG        Engineering mode
                SYS        System mode
```

Example Switches to the engineering mode
EE ENG

Description
- This command cannot be executed when data acquisition is in progress. However, if the operation of changing the settings when data acquisition is in progress is enabled (see the RC command), this command can be executed even when data acquisition is in progress.
- This command cannot be executed when the sign record screen is displayed.
- This command cannot be executed when data is being saved to an external storage medium.
- This command cannot be executed when there is data that has not been saved to the external storage medium.
- Can be executed even when data acquisition is in progress if the login function is not being used.

UD Switches the screen.

Refreshing the screen

Syntax UD p1<terminator>
p1 Switching the screen (0)

Example Refresh the screen.
UD 0

Changing to 1 panel display (only for DX200P)

Syntax UD p1,p2,p3<terminator>
p1 Switching the screen (1)
p2 Display item

TREND	Trend display
DIGITAL	Digital display
BAR	Bar graph display
OVERVIEW	Overview display (Alarm indicator)
ALARM	Alarm summary display
MESSAGE	Message summary display
MEMORY	Memory summary display
ALARMACK	Alarm ACK summary display

p3 Group number (1 to 6)

Example Set the display to 1 screen display, display the trend, and set the group number to 4.
UD 1,TREND,4

Description Parameter p3 is valid when p2 is set to TREND, DIGITAL, or BAR.

Switching to 4 panel display (only for DX200P)

Syntax UD p1,p2,p3,p4,p5,p6,p7,p8,p9<terminator>
p1 Switching the screen (2)
p2 The display item of the upper left quadrant of the divided screen (screen 1)

TREND	Trend display
DIGITAL	Digital display
BAR	Bar graph display
OVERVIEW	Overview display (Alarm indicator)
ALARM	Alarm summary display
MESSAGE	Message summary display
MEMORY	Memory summary display
ALARMACK	Alarm ACK summary display

p3 The group number (1 to 6) to display in the upper left quadrant of the divided screen (screen 1)
p4 The display item of the lower left quadrant of the divided screen (screen 2), same as the selections for p2.
p5 The group number (1 to 6) to display in the lower left quadrant of the divided screen (screen 2)
p6 The display item of the upper right quadrant of the divided screen (screen 3), same as the selections for p2.
p7 The group number (1 to 6) to display in the upper right quadrant of the divided screen (screen 3)
p8 The display item of the lower right quadrant of the divided screen (screen 4), same as the selections for p2.
p9 The group number (1 to 6) to display in the lower right quadrant of the divided screen (screen 4)

Example Set the screen to four screen display, the display item of screen 1 to trend display, the group number to display in screen 1 to 1, the display item of screen 2 to digital display, the group number to display in screen 2 to 2, the display item of screen 3 to bar graph display, the group number to display in screen 3 to 3, the display item of screen 4 to message summary display, and the group number to display in screen 4 to 4,
UD 2,TREND,1,DIGITAL,2,BAR,3,MESSAGE

Description The p3, p5, p7, and p9 parameters are valid when p2, p4, p6, and p8 are set to TREND, DIGITAL, or BAR.

Switches the 4 panel display (only for DX200P)

Syntax UD p1,p2<terminator>
p1 Switching the screen (3)
p2 4 panel display number (0 to 4)
- 0 Refresh the 4 panel display.
- 1 Display the screen of 4 panel display number 1.
- 2 Display the screen of 4 panel display number 2.
- 3 Display the screen of 4 panel display number 3.

```
            4   Display the screen of 4 panel
                display number 4.
Example     Display the screen of 4 panel display
            number 1.
            UD 3,1
```

Description
- Parameter p2=0 is valid when a 4 panel display is on the screen.
- 4 panel displays can be set using the SY command.

Turning ON or OFF automatic switching of the displayed groups, switching to all channel display from group display or vice versa, turning ON or OFF the scales, turning ON or OFF the numerical section on the trend screen, and switching the message display

```
Syntax      UD p1,p2,p3,p4,p5,p6<terminator>
            p1  Switching the screen (4)
            p2  Enables/disables automatic switching
                of the displayed groups (ON, OFF)
            p3  Switches all channel display and
                group display (ALL, GROUP)
            p4  Turns the scale display ON/OFF (ON/
                OFF)
            p5  Turns the numerical display section
                ON/OFF (ON, OFF)
            p6  Switches the message display (1, 2)
Example     Enables the automatic switching of the
            displayed groups, switches to group
            display from all channel display, turns
            ON the scale display, turns OFF the
            numerical section, and switches the
            message display to 2.
            UD 4,ON,GROUP,ON,OFF,2
```

Description
- Parameter p2 is valid on the trend, digital, or bar graph screens. Automatically switches the displayed groups. Use the SE command to set the switching interval (scroll time).
- Parameters p3 and p4 are valid on the trend screen.
- Parameters p5 and p6 are valid on the trend screen or on the trend screen on the 4 panel display (DX200P only).

PS Starts/Stops measurements (Memory Start/Stop)

```
Syntax      PS p1<terminator>
            p1  Starts/Stops measurements
                0   Start
                1   Stop
Example     Start measurement.
            PS 0
```

Description Acquires the display, event, and report data to the internal memory when the measurement is started.

AK Confirms the alarm status (alarm acknowledge)

```
Syntax      AK p1,p2,p3<terminator>
            p1  0 Acknowledge all alarms
                1 Acknowledge alarms individually
            p2  Channel number (DX100P: 01 to 12/31
                to 42, DX200P: 01 to 60)
            p3  Alarm number (1 to 4)
Example     Executes alarm acknowledge against the
            alarm number 3 on channel 02.
            AK 1,02,3
```

Description Parameters p2 and p3 are valid when p1=1.

EV Manual sample, snapshot, saving display data, and saving event data

```
Syntax      EV p1<terminator>
            p1  Operation type
                0   Perform manual sampling.
                2   Snapshot.
                3   Save the display data to the
                    storage medium.
                4   Save the event data to the
                    storage medium.
Example     Perform manual sampling.
            EV 0
```

Description
- EV3 is valid when the process type is set to [BATCH] (BI command), and the display data are being acquired to the internal memory (XM command). The display data residing in the internal memory can be stored to the external storage medium at arbitrary times.
- EV4 is valid when the process type is set to [CONTINUE] (BI command), and the event data are being acquired to the internal memory (XM command). The event data residing in the internal memory can be stored to the external storage medium at arbitrary times.

MS Writes the message (display and save)

```
Syntax      MS p1,p2<terminator>
            p1  Message group number (1 to 7)
            p1  Message number (1 to 8)
Example     Write the message of message number 8
            from the message group 1.
            MS 1,8
```

Description
- This command displays the message to the screen and writes the message to the internal memory.
- This command cannot be executed when measurement is stopped.

TL Starts/stops/resets computation (MATH)/Clears the computation dropout status display

Syntax TL p1<terminator>
p1 Operation type
0 Start computation
1 Stop computation
2 Reset computation
3 Clear the computation dropout status display
Example Start computation.
TL 0
Description This command can be used on models with the computation function option /M1.

EM Starts/stops the e-mail transmission function

Syntax EM p1<terminator>
p1 Starts/Stops the e-mail function
0 Start
1 Stop
Example Start the e-mail function.
EM 0

BB Sets the batch No. ans lot No.

Syntax BB p1,p2<terminator>
p1 Batch number (Up to 32 characters)
p2 Lot number (0 to 99999999)
Query BB?
Example Set the batch number to "LOT", the lot number to "2."
BB LOT,2
Description
- Parameter p2 cannot be specified unless the the DXP is set to use the lot number (p1, BL command).
- This command cannot be specified while measurement is in progress.

BC Sets the batch comment

Syntax BC p1,p2<terminator>
p1 Comment number (1 to 3)
p2 Character string (Up to 32 characters)
Query BC[p1]?
Example Set the character string "COMMENT" to the comment number 1.
BC 1,COMMENT
Description This command cannot be specified while measurement is in progress.

BQ Acknowledges user locked status

Syntax BQ p1,p2<terminator>
p1 Acknowledges user locked status (0)
Example Acknowledge user locked status.
BQ 0

BJ Writes the free message

Syntax BJ p1,p2<terminator>
p1 Message number (1 to 8)
p2 Message (Up to 32 characters)
Example Write the free message 1, “Start abc.”
BJ 1,Start abc
Description
- This command displays the message to the screen and writes the message to the internal memory.
- This command cannot be specified when measurement is stopped.

CM Sets the communication input data

Syntax CM p1,p2<terminator>
p1 Communication input data number (DX100P: C01 to C12, DX200P: C01 to C30)
p2 Communication input data
The range is –9.9999E+29 to –1.0000E –30, 0, and 1.0000E –30 to 9.9999E+29.
(The + sign of "E+" can be omitted.)
The maximum number of significant digits is 5.
Query CM?
Example Set the communication input data 1.0000E–10 in the communication input data number C01.
CM C01,1.0000E-10
Description
- This command can be used on models with the computation function option /M1.
- A specified user (EQ command) can use this command.

EJ Changes the password

Syntax EJ p1,p2,p3<terminator>
p1 Password in use (up to 8 characters)
p2 New password (up to 8 characters)
p2 New password for confirmation (up to 8 characters)
Example Change password to “BBBBBBBB” from “AAAAAAAA.”
EJ AAAAAAAA,BBBBBBBB,BBBBBBBB
Description
- Set the new password using 6 to 8 alphanumeric characters.
- When you logged into the monitor function, this command cannot be executed if there is a user who logged in using keys or a user logged into the setting function via the communications.

SD Sets the date and time

Syntax SD p1,p2<terminator>
p1 Date (YY/MM/DD fixed form)
YY Year (00 to 99)

MM Month (01 to 12)
DD Day (01 to 31)
p2 Time (HH:MM:SS fixed form)
HH Hour (00 to 23)
MM Minute (00 to 59)
SS Second (00 to 59)

Query SD?

Example Set the internal clock to 13:00:00, October 1, 2002.
SD 02/10/01,13:00:00

Description
- The form of p1 and p2 is fixed to 8 characters. Use the following form. Do not enter spaces in between the digits, as an error will occur.
  p1 = YY/MM/DD (Lower two digits of the year/month/day)
  p2 = HH:MM:SS (Hour:minute:second)
- This command cannot be executed when data acquisition is in progress. However, if the operation of changing date and time when data acquisition is in progress is enabled (see the RC command), this command can be executed even when data acquisition is in progress.
- This command cannot be executed when data is being saved to an external storage medium.

BE Saves the setup data for the engineering mode

Syntax BE p1<terminator>
p1 Store or discard the settings (STORE, ABORT)

Example Store the engineering mode settings.
BE STORE

Description
- When this command is executed, the DXP returns to the operation mode.
- When settings are changed, this command cannot be executed unless the external storage medium is inserted to the drive.

SY Sets the 4 panel display (only for DX200P)

Syntax SY p1,p2,p3,p4,p5,p6,p7,p8,p9, p10<terminator>
p1 Four screen display number (1 to 4)
p2 Four screen display name (Up to 16 characters)
p3 The display item of the upper left quadrant of the divided screen (screen 1)
TREND Trend display
DIGITAL Digital display
BAR Bar graph display
OVERVIEW Overview display (Alarm indicator)
ALARM Alarm summary display
MESSAGE Message summary display
MEMORY Memory summary display
ALARMACK Alarm ACK summary display
p4 The group number (1 to 4) to display in the upper left quadrant of the divided screen (screen 1)
p5 The display item of the lower left quadrant of the divided screen (screen 2), same as the selections for p3.
p6 The group number (1 to 4) to display in the lower left quadrant of the divided screen (screen 2)
p7 The display item of the upper right quadrant of the divided screen (screen 3), same as the selections for p3.
p8 The group number (1 to 4) to display in the upper right quadrant of the divided screen (screen 3)
p9 The display item of the lower right quadrant of the divided screen (screen 4), same as the selections for p3.
p10 The group number (1 to 4) to display in the lower right quadrant of the divided screen (screen 4)

Query SY[p1]?

Example Set the four panel display number to 1, four panel display name to 4DISPLAY1, the display item of panel 1 to trend display, the group number to display in panel 1 to 1, the display item of panel 2 to digital display, the group number to display in panel 2 to 2, the display item of panel 3 to bar graph display, the group number to display in panel 3 to 3, the display item of panel 4 to message summary display.
SY 1,4DISPLAY1,TREND,1,DIGITAL,2,BAR,3, MESSAGE

Description The p4, p6, p8, and p10 parameters are valid when p3, p5, p7, and p9 are set to a trend, digital, or bargraph displays.

ME Outputs data saved in the external storage medium (Either Ethernet or serial communication can be used)

Syntax ME p1,p2,p3<terminator>
p1 Operation type
DIR Output the file list
GET Output (first time)
NEXT Output (succeeding times), this parameter is used to output the remaining data when the first output operation is not adequate.

RESEND Retransmit the previous output
DIRNEXT Outputs the succeeding file list after the file list is output using the DIR command. The number of output lists is the p3 value specified with the DIR command. If this command is executed after all lists have been output, only the free space of the storage medium is output.
CHCDSK Outputs the free space of the storage medium.

p2 File name (Up to 26 characters)
Specify with a full path.

p3 The maximum number of file lists to be output (1 to 100). All file lists in the specified directory are output when p3 is omitted.

Example
· Output the list of all files in the root directory.
ME DIR,/
· Output 10 files of the file list of the root directory.
ME DIR,/,10
· Output the list of all files in the DATA0 directory.
ME DIR,/DATA0/*.*
· Output the list of all display data files in the DATA0 directory.
ME DIR,/DATA0/*.DDS
· Output the data in the file 72615100.DDS in the DATA0 directory.
ME GET,/DATA0/72615100.DDS

Description
- Parameter p2 is valid when p1 is set to DIR or GET.
- Parameter p3 is valid when p1 is set to DIR.
- This command can be used to output data over the communication interface (Ethernet or serial) that was selected with the XO command.
- If an error occurs during data transmission, (p1=) RESEND can be used to retransmit the data.

EC Clears the measured/computed data, initializes the setup data

Syntax EC p1<terminator>

p1 Type of data to be cleared or initialized
0 Clear all measured/computed data and initialize the setup data of the setting mode and basic setting mode.
1 Clear all measured/computed data and initialize the setup data of the setting mode.
2 Clear all measured/computed data.

Example Clear all measured/computed data.
EC 2

Description
- When this command is executed, you are logged out.
- When settings are changed, this command with p1=0 or 1 cannot be executed unless the external storage medium is inserted to the drive.
- The login information and the batch system settings are not initialized even if parameter p1 is 0.
- When parameter p1 is 0, settings related to communications are initialized. To login via the communications, resume the communication settings on the DXP.
- When settings are changed, this command cannot be executed unless the external storage medium is inserted to the drive.

YE Saves the setup data for the system mode

Syntax YE p1<terminator>

p1 Store or discard the settings (STORE, ABORT)

Example Store the basic settings.
YE STORE

Description
- When this command is executed, you are logged out.
- When settings are changed, this command cannot be executed unless the external storage medium is inserted to the drive.

CL Executes the time adjustment using the SNTP client function

Syntax CL p1<terminator>

p1 Fixed to 0

Example Execute time adjustment.
CL 0

Description When this command is executed, time information is retrieved from the SNTP server, and the time is adjusted.

LO Loads the engineering mode settings

Syntax LO p1<terminator>

p1 Setup file name (up to 8 characters excluding the extension)

Example Load the engineering mode settings of setup file ABC.PPL
LO ABC

Description
- Only the engineering mode settings are loaded from the setup file in the root directory of the storage medium. System mode

settings are not loaded.
- This command cannot be executed when data acquisition is in progress.

LL Logs in via the serial interface

Command used to log in via the serial interface. When this command is used, list the commands to be executed using sub delimiter (;). The command is executed after logging in and then automatically logs out.

Syntax
```
LO  p1,p2,p3,p4,p5<terminator>
p1  User name
p2  User ID
p3  Password
p4  New password when the password is
    expired
p5  New password (for confirmation)
```
Example
```
Login as User ABC (User ID: 5555 and
password: f2gyk6) and start data
acquisition.
LL ABC,5555,f2gyk6;PS 0
```
Description
- Users that are allowed to log in via communication can log in (see the EK and EL commands).
- If the user ID is not used, p2 is invalid.
- If the password is not expired, p4 and p5 are invalid. They can be omitted.
- This command cannot be used on the Ethernet interface.

BV Enters characters

This command is used for barcode input only.

Syntax
```
BV p1,p2<terminator>
p1  0 (fixed)
p2  Character string (up to 100
    characters)
```
Example
```
Enter “sample ABC.”
 BV 0,sample ABC
```
Description
- This command is valid when the cursor is at an item that requires character strings to be entered or when a window for entering character strings is displayed.
- You cannot enter password.

BP Enters the user name or the user name and user ID when logging in

This command is used for barcode input only.

Syntax
```
BP p1,p2,p3<terminator>
p1  Input type (1, 2)
    1 Enter user name
    2 Enter user mane and user ID
p2  User name (up to 20 characters)
p3  User ID (up to 8 characters)
```
Example
```
Enter “ABC2001” and “5555” as a user name
and user ID respectively.
BP 2,ABC2001,5555
```
Description
- If this command with parameter p1=1 is executed, the DXP waits user ID entered.
- If this command with parameter p1=2 is executed, the DXP waits password entered.

KE Executes key operations

This command is used for barcode input only.

Syntax
```
KE p1<terminator>
p1  Keys
DX100P
    F1 to F5   Soft keys 1 to 5
    ESC        ESC key
    MENU       MENU key
    FUNC       FUNC key
    START      START key
    STOP       STOP key
    USER       USER key
    DISP       DISP/ENTER key
    UP         Up arrow key
    DOWN       Down arrow key
    RIGHT      Right arrow key
    LEFT       Left arrow key
DX200P
    F1 to F7   Soft keys 1 to 7
    ESC        ESC key
    MENU       MENU key
    FUNC       FUNC key
    START      START key
    STOP       STOP key
    USER       USER key
    0 TO 9     Number "0" to "9" key
    MINUS      "-" key
    DOT        "." key
    DISP       DISP/ENTER key
    UP         Up arrow key
    DOWN       Down arrow key
    RIGHT      Right arrow key
    LEFT       Left arrow key
```
Example
```
Press the DISP/ENTER key.
KE DISP
```
Description Operates in the same fashion as the key operation on the DXP. For consecutive key operations, transmit the commands in the same order as the key operation on the DXP.

5.7 Output Commands

BO Sets the output byte order

Syntax BO p1<terminator>
p1 Byte order
0 Sends MSB first.
1 Sends LSB first.
Query BO?
Example Output MSB first
BO 0

Description
- This command is used to specify the byte order for the numerical data during binary output.
- A binary value 01011111, 00001010 is output in the order 00001010 first and 01011111 last, when LSB first is specified.

CS Sets the checksum

This command can be used only during serial communications.

Syntax CS p1<terminator>
p1 Use/not use checksum
0 Not use
1 Use
Query CS?
Example Use the checksum.
CS 1

IF Sets the status filter

Syntax IF p1<terminator>
p1 Status filter value
(0.0.0.0 to 255.255.255.255)
Query IF?
Example Set the status value to 1.0.4.0.
IF 1.0.4.0

Description For details, see chapter 7.

Note

Initialization of BO/CS/IF Command Settings

- **For Serial Communications**
  Settings entered using the BO/CS/IF commands revert to their initial values (output byte order, checksum = 0, status filter = 000.000.000.000) when the DXP is reset (when the power is turned OFF then ON, or the user exits the basic setting mode).
  If the DXP is reset, you must restore these settings.
- **For Ethernet Communications**
  Settings entered using the BO/IF commands revert to their initial values when the connection to the DXP is cut. After reconnecting the DXP, you must reenter the settings.

FC Outputs screen image data

Syntax FC p1<terminator>
p1 Outputs screen image data (GET)
Example Outputs screen image data from the DXP.
FC GET

Description Obtains the screen image data of the current screen and outputs the data in PNG format.

FE Outputs decimal position, unit information, and setup data

Syntax FE p1,p2,p3<terminator>
p1 Output data type
1 Decimal position and unit information
3 Decimal and unit information of the most recent TLOG value
4 Setup data file
p2 First channel number (DX100P: 01 to 12 or 31 to 42, DX200P: 01 to 30)
p3 Last channel number (DX100P: 01 to 12 or 31 to 42, DX200P: 01 to 30)
Example Output the decimal position and unit information of channel 1 through 5 from the DXP.
FE 0,01,05

Description
- Set the parameters for the first and last channel numbers so that the last channel number is greater than or equal to the first channel number.
- Parameters p2 and p3 are valid when p1 = 1 or 3.

FD Outputs the most recent measured/computed data

Syntax FD p1,p2,p3<terminator>
p1 Output data type
0 Output the most recent measured/computed data in ASCII format
1 Output the most recent measured/computed data in binary format.
4 Output the most recent TLOG data in ASCII format.
5 Output the most recent TLOG data in binary format.
6 Output the relay status.
p2 First channel number (DX100P: 01 to 12 or 31 to 42, DX200P: 01 to 60)
p3 last channel number (DX100P: 01 to 12 or 31 to 42, DX200P: 01 to 60)
Example Output the most recent measured/computed data from channel 1 to 5 in ASCII format.
FD 0,01,05

Description
- Set the parameters for the first and last channel numbers so that the last channel number is greater than or equal to the first channel number.

- Parameters p2 and p3 are valid when p1 = 0, 1, 4, or 5.

FF Outputs FIFO data

Syntax
```
FF p1,p2,p3,p4<terminator>
p1  Operation type
    GET      Output the data starting
             from the next to the
             previous read position
    RESEND   Retransmit the previous
             output
    RESET    Set the read position to the
             most recent acquire position
    GETNEW   Output the newest data
p2  First channel number (DX100P: 01 to
    12 or 31 to 42, DX200P: 01 to 30)
p3  last channel number (DX100P: 01 to 12
    or 31 to 42, DX200P: 01 to 30)
p4  The upper limit of number of blocks
    that are to be loaded (1 to 120)
    1 to 240 for models DX102P, DX104P,
    DX204P and DX208P
    1 to 60 for models DX106P, DX112P,
    DX210P, DX220P, and DX230P
    If the measured/computed data is less
    than the specified number of blocks,
    only the available data are
    transmitted.
```

Example
```
Output two blocks of FIFO data from
channels 1 to 10.
FF GET,01,10,2
```

Description
- The FIFO buffer is of a circular type which overacquires from the oldest data when it is full. The FR command is used to set the acquiring interval.
- There are two types of output method, GET and GETNEW.

  GET

  Output the specified number of blocks (p4) of FIFO data starting from the next to the previous read position (block). Make sure to read the data within the following buffer period to prevent data dropouts.
  - For models DX102P, DX104P, DX204P, and DX208P

    FIFO buffer length: 240 intervals (scan interval)

    Maximum buffer period: 240 x (acquiring period)
  - For models DX106P, DX112P, DX210P, DX220P, and DX230P

    FIFO buffer length: 60 intervals (scan interval)

    Maximum buffer period: 60 x (acquiring period)

  GETNEW

  Output the specified number of blocks (p4) of FIFO data back starting from the recent acquire position (block).
- Parameters p2 and p4 are valid when p1 is set to GET or GETNEW.
- If p4 is omitted, all the data of all blocks acquired in the FIFO buffer are output.
- Set the parameters for the first and last channel numbers so that the last channel number is greater than or equal to the first channel number.
- For the output flow of FIFO data, see appendix 2.

FL Outputs logs, alarm summary, and message summary

Syntax
```
FL p1,p2<terminator>
p1  Log type
    COM    Communication
    FTPC   FTP client
    ERR    Operation error
    KEY    Operation
    WEB    Web operation
    EMAIL  E-mail transmission
    ALARM  Alarm summary
    MSG    Message summary
    PANEL  Setting change
    SNTP   Access to SNTP server
p2  Maximum read length of the log
    When p1 is COM: 1 to 200
    When p1 is ALARM: 1 to 200
    When p1 is MSG: 1 to 200
    When p1 is KEY: 1 to 200
    When p1 is PANEL: 1 to 200
    When p1 is FTPC, ERR, WEB, or EMAIL:
    1 to 50
```

Example
```
Output the ten most recent operation
error logs.
FL ERR,10
```

Description
- Outputs logs that are saved in the DXP.
- If p2 is omitted, all logs saved are output.

FI Outputs a selected operation log

Syntax
```
FI p1,p2,p3,p4<terminator>
p1  Output format
    0 Fixed length
      The user name of the operation log
      is output using 20 characters.  If
      the user name is not 20 characters
      long, spaces are inserted to make
      the name 20 characters.  The
      detailed information of the
      operation is not output.
    1 Operation log format
      Same as the operation log.
p2  User name (up to 20 characters per
    user)
```

Specify multiple user names (up to five) by delimiting each name with a colon.

p3 Operations (up to 10 characters per operation)
Specify the operation using the character string that is output in the ASCII output of the operation log using the FL command
Specify multiple operations (up to five) by delimiting each name with a colon.

p4 Maximum number of output (1 to 10)

Example 1 Output the ten most recent operation logs whose operation is "login" for user tatsuya and kensuke at fixed length.
FI 0,tatsuya:kensuke,login,10

Example 2 Output the five most recent operation logs whose operation is "error" for all users at fixed length.
FI 0,,error,5 (All errors)
FI 0,,error2,5 (Errors 200 to 299)

Description
- The operation log saved in the DXP is extracted according to the specified conditions and output.
- If p2 is omitted, all users are specified.
- If more than 5 users are specified for p2, users after the 5th user are invalid.
- If the p2 is delimited using ":::::" without specifying users, designations after the 5th user are invalid.
- If p3 is omitted, all operations are specified.
- If more than 5 items are specified for p3, items after the 5th item are invalid.
- If the p3 is delimited using ":::::" without specifying items, designations after the 5th item are invalid.
- Parameter p4 can be omitted.
- If the following operation is specified, a number can be specified after the operation.
  - Error
  - Warning

IS Outputs status information

Syntax IS p1<terminator>
p1 0 (Fixed)

Example Output status information.
IS 0

Description The output status can be masked using the status filter (IF command).

FU Outputs user information

Syntax FU p1<terminator>
p1 Output information
0 Output user information
1 Output the detailed user information of all users logged in
2 Output the simplified user information of all users logged in

Example Output user information.
FU 0

Description Outputs the information of the user currently connected to the DXP.

5.8 RS-422A/485 Dedicated Commands

ESC O Opens the instrument

The ASCII code of ***ESC*** is 1BH. See appendix 1.

Syntax ***ESC*** O p1<terminator>

p1 Instrument's address (01 to 32)

Example Open the instrument at address 01, and enable all commands.

ESC O 01

Description
- Specifies the address of the device with which to communicate.
- Only one instrument can be opened at any given time.
- When an instrument is opened with the ESC O command, any other instrument that is currently open is automatically closed.
- When this command is received correctly, the DXP transmits the data "***ESC*** 0 □□."
- Normally, either CR+LF or LF can be used as terminators for communication commands. However, the terminator for this command must be CR+LF.

ESC C Closes the instrument

The ASCII code of ***ESC*** is 1BH. See appendix 1.

Syntax ***ESC*** C p1<terminator>

p1 Instrument's address (01 to 32)

Example Close the instrument with the address 01.

ESC C 01

Description
- Clears the current connection with the instrument.
- When this command is received correctly, the DXP transmits the data "***ESC*** C □□."
- Normally, either CR+LF or LF can be used as terminators for communication commands. However, the terminator for this command must be CR+LF.

5.9 Maintenance/Test Commands

close Disconnects the connection between other devices

Syntax close,p1,p2:p3<terminator>

p1 Port on the DXP side (0 to 65535)

p2 IP address on the PC side (0.0.0.0 to 255.255.255.255)

p3 Port on the PC side (0 to 65535)

Example close,34159,192.168.111.24:1054

E0

Description This command cannot be used to disconnect a server port. Also, it cannot disconnect the DXP being operated. Use the quit command for this purpose.

con Outputs connection information

Syntax con<terminator>

Example

```
con
EA
00/00/00 12:34:56

Active connections

Proto Local Address      Foreign Address    State
TCP  192.168.111. 24:34159  192.168.111. 24:1053 ESTABLISHED
TCP    0.  0.  0.   0:34155    0.  0.  0.  0:   0 LISTEN
TCP    0.  0.  0.   0:34159    0.  0.  0.  0:   0 LISTEN
TCP    0.  0.  0.   0:34150    0.  0.  0.  0:   0 LISTEN
EN
```

TCP
Protocol used.

Local Address
The DXP's socket address.
Displays "IP address : port number."

Foreign Address
The destination socket address.
Displays "IP address : port number."

State
Connection status

ESTABLISHED
Connection established

eth Outputs Ethernet statistical information

Syntax eth<terminator>

Example

```
eth
EA
00/00/00 12:34:56

Ethernet Statistics

Name     In Pkt  In Err  Out Pkt   Out Err   16 Coll
lo0      0       0       0         0         0
mb0      74      0       64        0         0
EN
```

help Outputs help

Syntax help [,p1]<terminator>

p1 Command name
(close, con, eth, help, net, quit)

Example

```
help
EA
con   - echo connection information
eth   - echo Ethernet information
help  - echo help
net   - echo network status
quit  - close this connection
EN
```

net Outputs network statistical information

Syntax net<terminator>

Example

```
net
EA
00/00/00 12:34:56

Network Status

APP: power on time = 00/00/00 12:34:56
APP: applalive     = disable
APP: genedrops     = 0
APP: diagdrops     = 0
APP: ftpsdrops     = 0
TCP: keepalive     = 30 s
TCP: connects      = 14
TCP: closed        = 0
TCP: timeoutdrop   = 0
TCP: keepdrops     = 0
TCP: sndtotal      = 53
TCP: sndbyte       = 0
TCP: sndrexmitpack = 0
TCP: sndrexmitbyte = 1
TCP: rcvtotal      = 0
TCP: rcvbyte       = 0
DLC: 16 collisions = 0
EN
```

TCP: keepalive
Keepalive check cycle

TCP: connects
Total number of established connections.

TCP: closed
Total number of dropped connections.

TCP: timeoutdrop
Total number of dropped connections due to TCP retransmission timeout. When the transmitted packet (the unit of transmitted data) is not received, the packet is automatically retransmitted at a predetermined time interval. If the packet is not received after 14 retransmissions, timeout occurs and the connection is dropped.

TCP: keepdrops
Total number of dropped connections due to TCP keepalive timeout.

TCP: sndtotal
Total number of transmitted packets.

TCP: sndbyte
Total number of transmitted bytes.

TCP: sndrexmitpack
Total number of retransmitted packets.

TCP: sndrexmitbyte
Total number of retransmitted bytes.

TCP: rcvtotal
Total number of received packets.

TCP: rcvbyte
Total number of received bytes.

DLC: 16 collisions
Number of collision incidents. A collision occurs when two or more devices on the network attempt to transmit simultaneously. The tendency for collisions to occur increases when the network is congested. 16 collisions would mean 16 consecutive collision incidents.

quit Disconnects the connection of the device being operated

Syntax quit<terminator>

6.1 Response Syntax (Measurement Server)

Describes the responses to the commands in chapter 5.
The DXP returns a response (affirmative/negative/Output response) to a command that is separated by a single delimiter. The controller should follow the one command to one response format. When the command-response rule is not followed, the operation is not guaranteed.

Note

The "CRLF" used in this section denotes carriage return line feed.

Affirmative Response

When the command is processed correctly, an affirmative response is returned.

Syntax

```
E0CRLF
```

Example

```
E0
```

Single Negative Response

When the command is not processed correctly, a single negative response is returned.

Syntax

```
E1_nnn_mmm···mCRLF
  nnn      Error number (001 to 999)
  mmm···m  Message (Variable length, one line)
  _        Space
```

Example

```
E1 001 "System error"
```

Multiple Negative Responses

- If there is an error in any one of the multiple commands that are separated by sub delimiters, multiple negative response are returned.
- The response is generated for each erroneous command.
- If there are multiple commands that have errors, the negative responses are separated by commas.
- The error position number is assigned to the series of commands in order starting with "1" assigned to the first command.

Syntax

```
E2_ee:nnnCRLF                    (When there is only one error)
E2_ee:nnn,ee:nnn,···,ee:nnnCRLF  (When there are multiple errors)
  ee       Error position (01 to 10)
  nnn      Error number (001 to 999)
  _        Space
```

Example

```
E2 02:001
```

ASCII Output

The following types of ASCII data are available. For the data formats, see section 6.2.

ASCII data	Output command
Decimal position/unit information	FE
Measured/computed data	FD
Communication log, FTP log, Error log, Operation log, Web operation log, E-mail log, Alarm summary, Message summary, Setting change log, SNTP log	FL
Outputs a selected operation log	FI
Status information	IS
Relay status	FD
User information	FU
Setting information output by a query command	See sections 5.4 and 5.5.

Syntax

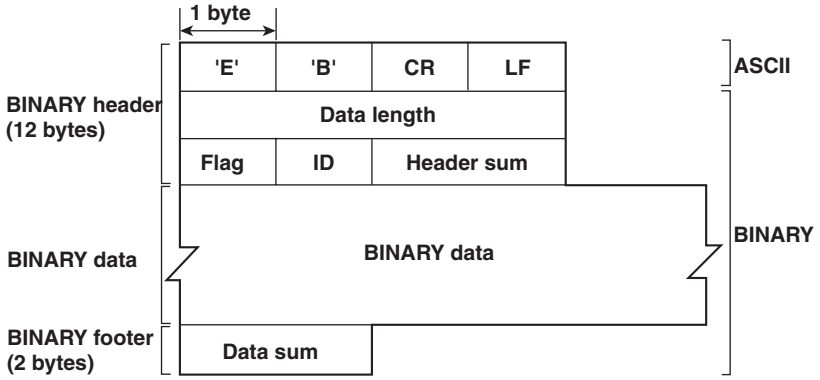
```
EACRLF
···············CRLF
    :
···············CRLF
···············CRLF
ENCRLF
```

BINARY Output

The following types of BINARY data are available.

BINARY Data	Output Command
Measured/computed data	FD
FIFO data (measured/computed data)	FF
Screen image data	FC
Setup data	FE
Files on the external storage medium	ME

Conceptual diagram



EB*CRLF*

Indicates that the data are BINARY.

Data length

The byte value of “flag + identifier + header sum + BINARY data + data sum.”

Note

The data length of the BINARY header section is output according to the byte order specified with the BO command.

Header sum

The sum value of “data length + flag + identifier” (during serial communications)

Note

On the Ethernet network, checksum is carried out automatically in the TCP/IP layer. Therefore, “Header sum” and “Data sum” are not used. Their values are fixed to 0.

BINARY data

For the output format of various data types, see section 6.3.

Data sum

The sum value of “BINARY data” (during serial communications)

Flag

Bit	Name (abbreviation)	Flag 0	Flag 1	Meaning of the flag
7	BO	MSB	LSB	Output byte order
6	CS	No	Yes	Existence of a check sum (on the serial communications only)
5 to 1	–	–	–	
0	END	Middle	End	In the middle or at the end of the continuous data

- When the BO flag is 0, the data length and output data are output MSB first. When the BO flag is 1, the data is output LSB first.
- If the check sum is enabled (parameter = 1) using the CS command parameter on the serial communications, each sum value is inserted in the header sum and data sum sections in the “Conceptual diagram” on the previous page. If the check sum is disabled (parameter = 0), a zero is inserted in the header sum and data sum sections. For a sample program that calculates the sum value, see “Calculating the sum value” on the next page.
- When the amount of data output in response to a ME command is large, all of the data may not be able to be returned in one output request (parameter GET). In this case the END flag becomes “0.” You must send output requests (parameter NEXT) to receive the rest of the data until the END flag becomes “1.”
- The bits that have “–” for the name and flag are not used. The value is undefined.

Identifier

ID number	BINARY data type	Type	Format	Output command
0	Reserved	–	–	–
1	Measured/computed data	data	Section 6.3	FD
1	FIFO data		Section 6.3	FF
2, 3	Reserved	–	–	–
4	Manual sampled data file	File (DMN)	Appendix 2*	ME
5	Hourly report file	File (DHR)	Appendix 2*	ME
6	Daily report file	File (DDR)	Appendix 2*	ME
7	Weekly report file	File (DWR)	Appendix 2*	ME
8	Monthly report file	File (DMR)	Appendix 2*	ME
9	TLOG data file	File (DTG)	Undisclosed	ME
10 to 12	Reserved	–	–	–
13	Screen image data	File (PNG)	PNG format	FC
14	Reserved	–	–	–
15 to 19	Not used	–	–	–
20	Setup data	File (PPL)	Undisclosed	FE
21	Display data file	File (DBD)	Undisclosed	ME
22	Event data file	File (DBE)	Undisclosed	ME
23	Setting change log file	File (DPL)	Appendix 2*	ME
24	Reserved	–	–	–

* See the DX100P/DX200P User’s Manual.

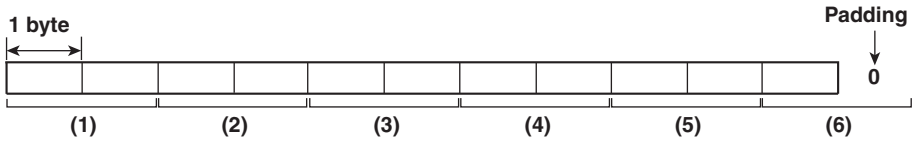
Calculating the sum value

If you set the parameter of the CS command to “1 (enabled),” the checksum value is output only during serial communications. The sum value can be derived from the following algorithm.

* On the Ethernet network, checksum according to the following algorithm is carried out automatically in the TCP/IP layer. Therefore, this checksum is not used. Header sum” and “data sum” are fixed to 0.

Buffer on which the sum value is calculated

- For the header sum, it is calculated from “data length + flag + identifier” (fixed to 6 bytes).
- For the data sum, it is calculated from “BINARY data.”



If the data length of the buffer is odd, a “0” is padded so that it is even. (1) through (6) are summed as unsigned two-byte integers (unsigned short). When the digit overflows a “1” is added. Finally, the result is bit-wise inverted.

Sample program

The sum value is determined using the following sample program, and the calculated result is returned. The sum determined by the sample program can be compared with the header sum of the output BINARY header section and the data sum of the output BINARY footer section.

```
/*
 * Sum Calculation Function (for a 32-bit CPU)
 *
 * Parameter  buff   : Pointer to the top of the data on which the sum is calculated
 *            len    : Length of the data on which the sum is calculated
 * Returned value   : Calculated sum
 */

int    cksum(unsigned char *buff, int len)
{
   unsigned short *p;      /* Pointer to the next two-byte data word in the buffer that is to be summed. */
   unsigned int  csum;     /* Checksum value */
   int    i;
   int    odd;
   csum = 0;               /* Initialize. */
   odd = len%2;            /* Check whether or not the number of data points is even. */
   len >>= 1;              /* Determine the number of data points using a "short" data type. */
   p = (unsigned short *)buff;

   for(i=0;i<len;i++)      /* Sum using an unsigned short data type. */
      csum += *p++;

   if(odd){                /* When the data length is odd */
      union tmp{           /* Pad with a 0, and add to the unsigned short data. */
      unsigned short s;
      unsigned char c[2];
      }tmp;
      tmp.c[1] = 0;
      tmp.c[0] = *((unsigned char *)p);
      csum += tmp.s;
   }

   if((csum = (csum & 0xffff) + ((csum>>16) & 0xffff)) > 0xffff)
                           /* Add the overflowed digits */
      csum = csum - 0xffff;   /* If the digit overflows again, add a 1. */

   return((~csum) &  0xffff); /* bit inversion */
}
```

RS-422A/485 Dedicated Response

The following table shows dedicated commands for the RS-422A/485 interface and their responses.

Command syntax	Meaning	Response
ESC O_xx CRLF (_ Space)	Open the instrument	• Response from the instrument with the specified address ESC_O_xx_CRLF • Response when the instrument with the specified address does not exist* None
ESC C_xx CRLF (_ Space)	Close the instrument	• Response from the instrument with the specified address ESC_C_xx_CRLF • Response when the instrument with the specified address does not exist* None

* The causes that the condition become “The instrument with the specified address does not exist” is such as a command error, the address not matching that of the instrument, the instrument is not being turned ON, and the instrument not being connected via the serial interface.

- The “xx” in the table indicates the instrument's address. Specify the address that is assigned to the instrument from 01 to 32.
- Only one instrument can be opened at any one time.
- When an instrument is opened with the ESC O command, all commands on the instrument become active.
- When an instrument is opened with the ESC O command, any other instrument that is open is automatically closed.
- Normally, either CR+LF or LF can be used as terminators. However, the terminator for this command must be CR+LF.

Note

The ASCII code of **ESC** is **1BH**. See appendix 1.

6.2 Output Format of ASCII Data

Note

The "CRLF" used in this section denotes carriage return line feed.

Decimal Position/Unit Information

- The FE command is used to output the data.
- The physical value can be obtained from the mantissa of the measured/computed data that is output in BINARY format using the FD command or FF command (see section 6.3) and the decimal point position and unit information obtained using the FE command.

Syntax

```
EACRLF
s_kccuuuuuu,ppCRLF
..................
ENCRLF
```

s	Data status
	N : Normal
	D : Differential input
	S : Skip (When the measurement range is set to SKIP for a measurement channel or when the channel is turned OFF for a computation channel)
k	Channel type
	0 : Measurement channel
	A : Computation channel
cc	Channel number
	01 to 60
uuuuuu	Unit information (6 characters, left-justified)
	mV____ : mV
	V_____ : V
	^C____ : °C
	xxxxxx : (user-defined character string)
pp	Decimal position (00 to 04)
	No decimal (00000) for 00.
	One digit below the decimal (0000.0) for 01.
	Two digits below the decimal (000.00) for 02.
	Three digits below the decimal (00.000) for 03.
	Four digits below the decimal (0.0000) for 04.
_	Space

Example

```
EA
N 001mV    ,01
N 002mV    ,01
EN
```

Most Recent Measured/Computed Data

The FD command is used to output the data.

Syntax

EACRLF
DATE_yy/mo/ddCRLF
TIME_hh:mi:ss.mmmtCRLF
s_kcca$_1$a$_2$a$_3$a$_4$uuuuuufdddddE-ppCRLF
.....
ENCRLF

yy	Year (00 to 99)
mo	Month (01 to 12)
dd	Day (01 to 31)
hh	Hour (00 to 23)
mi	Minute (00 to 59)
ss	Second (00 to 59)
mmm	Millisecond (000 to 999. A period is placed between seconds and milliseconds.)
t	Summer time or winter time S: summer time (Space): winter time
s	Data status N : Normal D : Differential input S : Skip O : Over E : Error
k	Channel type 0 : Measurement channel A : Computation channel
cc	Channel number 01 to 60
a$_1$a$_2$a$_3$a$_4$	a$_1$ Alarm status (alarm number 1) a$_2$ Alarm status (alarm number 2) a$_3$ Alarm status (alarm number 3) a$_4$ Alarm status (alarm number 4) (Each status is set to H, L, h, l, R, r, T, t, or space.) (H : upper limit alarm, L : lower limit alarm, h : difference upper-limit alarm, l : difference lower-limit alarm, R : upper limit on rate-of-change alarm, r : lower limit on rate-of-change alarm, T : delay upper limit alarm, t : delay lower limit alarm, space : no alarm)
uuuuuu	Unit information (6 characters, left-justified) mV____: mV V_____: V ^C____: °C xxxxxx: (user-defined character string)

```
f          Sign (+, -)
ddddd      Mantissa (00000 to 99999, 5 digits)
           · 8 digits for computed data.
           · For abnormal data (data status is E) or data of which
             the mantissa or the exponent exceeds the range (data
             status is O), the mantissa is set to 99999 (99999999 for
             computed data).
pp         Exponent (00 to 04)
_          Space
```

Example

```
EA
DATE 99/02/23
TIME 19:56:32.500
N 001h   mV    +12345E-03
N 002    mV    -67890E-01
S 003
EN
```

Note

- Data for non-existing channels are not output (not even the channel number).
- For channels set to Skip, output values from alarm status to exponent are spaces.

Communication Log

- The FL command is used to output the data.
- A log of commands and responses is output. Up to 200 logs are retained. Logs that exceed 200 are cleared from the oldest data.

Syntax

```
EACRLF
yy/mo/dd_hh:mi:ss_n_uuu···ufd_mmm···mCRLF
.....................................
ENCRLF

  yy       Year (00 to 99)
  mo       Month (01 to 12)
  dd       Day (01 to 31)
  hh       Time (00 to 23)
  mi       Minute (00 to 59)
  ss       Second (00 to 59)
  n        Connection ID.  A number used to identify the connection.
           0 : serial
           1 or 2 : Ethernet
  uuu···u  User name (up to 20 characters). For serial communications,
           the user name is set to “serial.”
           If no administrators are registered, the user logged into
           Ethernet/setting function is “admin”; the user logged into
           Ethernet/monitor function is “user.”
  f        Multiple command flag
           (Space) : single
           * : multiple
             If multiple commands are separated by sub delimiters and
```

output at once, “*” is displayed. The multiple commands are divided at each sub delimiter and stored as individual logs (1 log for 1 command and 1 log for 1 response).

d Input/Output
> : input
< : output

mmm···m Message (up to 20 characters)
· The communication log contains only the error number and not the error message section..
· Normally, the transfer data are transmitted as they are, but in some cases, a special message is output. The special messages are shown below.

Reception

(Over length) : Command length exceeded.
(Over number) : Number of commands exceeded
(Serial error) : Received an error character through serial communications.

Transmission

(login): Ready to receive commands via the Ethernet interface.
(logout): Not ready to receive commands via the Ethernet interface.
(ddd byte) : data output (ddd is the number of data points)
(Login) : login
(Logout) : logout
(Disconnected) : Forced disconnection (occurs when the connection was disconnected by the maintenance/*test server, etc.)
(Time out) : Disconnection caused by a timeout, keepalive, etc.
E1 nnn : single negative response. nnn is the error number.
E2 ee:nnn : multiple negative response.ee is the error position, nnn is the error number.

_ Space

Example

The following example shows the log when multiple commands separated by sub delimiters, “B01;???;BO1,” are transmitted. The commands are separated and output in order with the multiple command flags “*.”

```
EA
99/05/11 12:31:11 1 user              *> BO1
99/05/11 12:31:11 1 user              *< E0
99/05/11 12:31:11 1 user              *> ???
99/05/11 12:31:11 1 user              *< E2 01:124
99/05/11 12:31:11 1 user              *> BO1
99/05/11 12:31:11 1 user              *< E0
EN
```

FTP Log

- The FL command is used to output the data.
- The FTP client log is output. Up to 50 file transfer logs are retained. Logs that exceed 50 are cleared from the oldest log.

Syntax

```
EACRLF
yy/mo/dd_hh:mi:ss_nnn_xxxxxxxxx_k_ffffffff_eeeCRLF
.................................
ENCRLF
```

```
yy         Year (00 to 99)
mo         Month (01 to 12)
dd         Day (01 to 31)
hh         Hour (00 to 23)
mi         Minute (00 to 59)
ss         Second (00 to 59)
nnn        Error number (__1 to 999, see appendix 6)
xxxxxxxxx  Detailed code (9 characters)
k          Server type (FTP destination)
           P : Primary
           S : Secondary
ffffffff   File name (8 characters)
eee        Extension (3 characters)
_          Space
```

Example

```
EA
99/07/26 10:00:00              P 72610000 DDR
99/07/27 10:00:00              P 72710000 DDR
99/07/28 10:00:00 123 HOSTADDR P 72810000 DDR
99/07/29 10:00:00 123 HOSTADDR P 72910000 DDR
EN
```

Error Log

- The FL command is used to output the data.
- The operation error log is output. Up to 50 operation error logs are retained. Logs that exceed 50 are cleared from the oldest log.
- Other communication messages (400 to 999) and status messages (500 to 599) are not output.

Syntax

```
EACRLF
yy/mo/dd_hh:mi:ss_nnn_uuu···uCRLF
.............................
ENCRLF
```

```
yy       Year (00 to 99)
mo       Month (01 to 12)
dd       Day (01 to 31)
hh       Hour (00 to 23)
mi       Minute (00 to 59)
```

```
ss       Second (00 to 59)
nnn      Error code (__1 to 999, see appendix 6)
uuu···u  Error message (Up to 80 characters)
_        Space
```

Example

```
EA
99/05/11 12:20:00 210 "Media has not been inserted."
99/05/11 12:30:00 217 "Unknown file type."
EN
```

Operation Log

- The FL command is used to output the data.
- The log of key operation and the remote control operation is output. Up to 2000 operation logs are retained. Logs that exceed 2000 are cleared from the oldest log.

Syntax

```
EACRLF
yy/mo/dd_hh:mi:ss_xxxxxxxxxx_mmm_uuu···u_ccc···cCRLF
.....................................
ENCRLF
```

```
yy       Year (00 to 99)
mo       Month (01 to 12)
dd       Day (01 to 31)
hh       Hour (00 to 23)
mi       Minute (00 to 59)
ss       Second (00 to 59)
xxx···x  Operation(10 characters)
         Login: Logging in
         Logout: Logging out
         UserLocked: The user is invalidated.
         MemStart: Memory Start
         MemStop: Memory Stop
         AlarmACK: Releasing the alarm indication and output relay
         Message: Writing a message
         Manual: Manual sampling
         MathStart: Starting the computation
         MathStop: Stopping the computation
         MathReset: Resetting the computation
         MathACK: Clearing the computation dropout display
         Snapshot: Saving the screen image
         MailStart: Starting the e-mail transmission
         MailStop: Stopping the e-mail transmission
         DispSave: Saving the display data
         EventSave: Saving the event data
         DispLoad: Loading the display data
         EventLoad: Loading the event data
         NewTime: Newly set time
         TimeChg: Setting the date and time using operation keys
         TimeAdj: Adjusting the internal clock
         Clear1: Executing Clear 1 Initialization
```

Clear2: Executing Clear 2 Initialization
Clear3: Executing Clear 3 Initialization
TRevStart: Starting time adjustment
TRevEnd: Ending time adjustment
SNTPtimset: Adjusting the time at once using SNTP
TimeDST: Changing the DST start/end time
LoginLoad: Loading the login information*1
BatchNoSet: Setting the batch number
LotNoSet: Setting the lot number
PowerOff: The power is turned Off.
PowerOn: The power is turned On.
EngLoad: Loading the setup data on the engineering mode
SysLoad: Loading the setup data on the system mode
EngSet: Changing the engineering mode setup data
SysSet: Changing the system mode setup data*2
LoginSet: Changing the login information*1
Log&SysSet: Changing the system mode setup data*2 and the login information
Eng&SysSet: Changing the engineering mode and the system mode setup data*2
Log&EngSet: Changing the engineering mode settings and login information*1 settings
AllSet: Changing the engineering mode settings, system mode settings*2, and login information*1 settings
EngSave: Saving the setup data on the engineering mode
SysSave: Saving the setup data on the system mode
ErrorXXX: Error operation (XXX: Error code)
WarningXXX: Warning (XXX: code)
ChgPasswd: Changing password
ConctClose: Being closed by the maintenance/test server
FileGet: Getting files from the DXP
FilePut: Putting files to the DXP
UsrLockACK: Clearing the User Locked icon
A/DCalDisp: Entering the AD calibration mode*3
A/DCalExec: Executing the AD calibration*3
CCSet##: Changing the calibration correction settings while data acquisition is in progress (where ## is the channel number)
MemorySave: Executing the data save operation of the internal memory while data acquisition is stopped

*1 Information on the registered users
*2 Excludes the login information.
*3 For maintenance purposes. The operating procedure is not described in this manual.

mmm Operation type
KEY: Key operation
REM: Remote control
MRS: Setting function (setting/measurement server)
FTP: FTP server

```
          ms_:    Monitor function (setting/measurement server)
          TST:    Setting function (maintenance/test server)
          ts_:    Monitor function (maintenance/test server)
          SRL:    Serial communications
          SYS:    Automatic operation by the DXP
uuu···u   User name (20 characters)
ccc···c   Detailed information
          Outputs detailed information for the following operations.

· When xxxxxxxxxx = CCSet##
  When the number of set points is changed
  Point: aaa -> bbb

    aaa: The number of set points before the change (Off, 01 to 16)
    bbb: The number of set points after the change (Off, 01 to 16)

  When the measured value or true value of a certain point is
  changed
  pp: ccccccc/ddddddd -> eeeeeee/fffffff

    pp:         Set point that was changed
    ccccccc:    Measured value of pp before the change
    ddddddd:    True value of pp before the change
    eeeeeee:    Measured value of pp after the change
    fffffff:    True value of pp after the change

· When xxxxxxxxxx = TRevStart
  Adjust time = amm:ss.xxx.yyy

    amm:ss.xxx.yyy      Deviation from the adjustment time
        a:              Sign (-: behind, +: ahead)
        mm.ss.xxx.yyy: mm: minutes, ss: seconds, xxx: milliseconds,
                       yyy: microseconds
_       Space
```

Example

```
EA
99/05/11 12:20:00 AlarmACK   KEY administrator4567890
01/06/12 12:30:00 CCset01    KEY uchiyama Point: 002 -> 003
01/06/12 12:30:00 CCset01    KEY uchiyama 03: 1234567/1234555 ->
  1234567/1234666
01/06/12 12:30:00 TRevStart  KEY uchiyama Adjust time = -01:01.125.000
01/06/12 12:30:00 TRevEnd    SYS uchiyama
01/06/12 12:30:00 Error085   KEY
EN
```

Output of a Selected Operation Log

- The FI command is used to output the data.
- The log of operations using the DXP keys or the remote control function is output. Up to 2000 logs are retained in the internal memory. Logs that exceed 2000 are cleared from the oldest data.

Syntax

Same as the operation log.

Example

Assume that an operation log of the following 8 items is stored.

```
EA
99/05/11 12:20:00 AlarmACK   KEY yoshino
99/05/11 12:30:00 ChgPasswd  KEY tsuchiya
01/06/11 10:00:00 TimeAdj    REM tsuchiya
01/06/12 12:30:00 MathStart  KEY uchiyama
01/06/13 12:30:00 MathStop   KEY uchiyama
01/06/14 12:30:00 Message    KEY uchiyama
01/06/15 12:30:00 MathStart  KEY tsuchiya
01/06/16 12:30:00 MathStop   KEY tsuchiya
EN
```

As shown below, the logs that match the conditions specified by the command are extracted and output.

- For the command "`FI0, ,MathStart,1`", the log at line 7 is output

  ```
  EA
  01/06/15 12:30:00 MathStart  KEY tsuchiya
  EN
  ```

- For the command "`FI0,yoshino:tsuchiya,,10`", logs at lines 1, 2, 3, 7, and 8 are output
- For the command "`FI0,,MathStart:MathStop,10`", logs at lines 4, 5, 7, and 8 are output
- For the command "`FI0,,MathStart:MathStop,2`", logs at lines 7 and 8 are output
- For the command "`FI0,uchiyama,MathStart,10`", the log at line 4 is output

Web Operation Log

- The FL command is used to output the data.
- The log of operations on the operator page is output. Up to 50 logs are retained. Logs that exceed 50 are cleared from the oldest log.

Syntax

```
EACRLF
yy/mo/dd_hh:mi:ss_ffffff_eee_???···CRLF
·····························
ENCRLF

  yy         Year (00 to 99)
  mo         Month (01 to 12)
  dd         Day (01 to 31)
  hh         Hour (00 to 23)
  mm         Minute (00 to 59)
  ss         Second (00 to 59)
  ffffff     Operation code
             SCREEN : Switching screens
             KEY : Key operation
  eee        Error code
             All space : succeeded
             001 to 999 : Error code
  ???···     Detailed operation code
             When ffffff=SCREEN
             yy/mo/dd_hh:mm:ss_ffffff_eee_ddddd...nnCRLF
             ddddd : Screen
                   TREND : Trend screen
                   DIGIT : Digital screen
                   BAR : Bar graph screen
             nn : Group number (01 to 06)

             When ffffff=KEY
             yy/mo/dd_hh:mm:ss_ffffff_eee_kkkkkCRLF
             kkkkk : Key
                   DISP : The DISP/ENTER key
                   UP : The up arrow key
                   DOWN : The down arrow key
                   LEFT : The left arrow key
                   RIGHT : The right arrow key
  _        Space
```

Example

```
EA
01/02/11 12:20:00 SCREEN 275 TREND 01
01/02/11 12:21:00 SCREEN     BAR   01
01/02/11 12:30:00 KEY        UP
01/02/11 12:31:00 KEY        RIGHT
EN
```

E-Mail Log

- The FL command is used to output the data.
- The log of e-mail transmission is output. Up to 50 logs are retained. Logs that exceed 50 are cleared from the oldest log.

Syntax

```
EACRLF
yy/mo/dd_hh:mi:ss_fffff_eee_n_uuu···uCRLF
·····································
ENCRLF
```

yy	Year (00 to 99)
mo	Month (01 to 12)
dd	Day (01 to 31)
hh	Hour (00 to 23)
mi	Minute (00 to 59)
ss	Second (00 to 59)
fffff	E-mail type
	ALARM : Mail at the alarm occurrence/release
	TIME : Mail at the scheduled time
	REPORT : Mail at the report creation
	FAIL : Mail at the recovery from the power failure
	FULL : Mail at the memory end
	TEST : Test mail
	ERROR : Error message mail
	PASSWD: User lock occurrence mail
eee	Error code
	All space : Succeeded
	__1 to 999 : Error code (see appendix 6)
n	Recipient code
	1 : Recipient 1
	2 : Recipient 2
	+ : Recipient 1 and Recipient 2
uuu···u	Recipient's e-mail address (Up to 30 characters)
_	Space

Example

```
EA
01/05/11 12:20:00 ALARM      + notice
01/05/11 12:30:00 REPORT 375 1 user1 user2
EN
```

Alarm Summary

- The FL command is used to output the data.
- The alarm summary is output. Up to 240 alarms are retained. Alarms that exceed 240 are cleared from the oldest alarm.

Syntax

```
EACRLF
yy/mo/dd_hh:mi:ss_kcc_ls_YY/MO/DD_HH:MI:SS, _Ya/Ma/
  Da_ha:ma:sa_mmm_uuu···uCRLF
.................................
ENCRLF
```

yy/mo/dd_hh:mi:ss		Alarm occurrence time
	yy	Year (00 to 99)
	mo	Month (01 to 12)
	dd	Day (01 to 31)
	hh	Hour (00 to 23)
	mi	Minute (00 to 59)
	ss	Second (00 to 59)
k	Channel type	
	0 : Measurement channel	
	A : Computation channel	
cc	Channel number	
	01 to 60	
l	Alarm number (1 to 4)	
s	Alarm type (H,h,L,l,R,r,T,t)	
	01 to 60	
YY/MO/DD_HH:MI:SS		
	Alarm release time (filled with spaces when the alarm is not released)	
	YY	Year (00 to 99)
	MO	Month (01 to 12)
	DD	Day (01 to 31)
	HH	Hour (00 to 23)
	MI	Minute (00 to 59)
	SS	Second (00 to 59)
Ya/Ma/Da ha:ma:sa		
	Alarm ACK time (filled with spaces when the alarm ACK is not carried out yet, or the alarm occurrence time when	
alarm		ACK is not in use)
	ya	Year (00 to 99)
	Ma	Month (01 to 12)
	Da	Day (01 to 31)
	ha	Hour (00 to 23)
	ma	Minute (00 to 59)
	sa	Second (00 to 59)
mmm	Operation type	
	KEY: Key operation	
	REM: Remote control	
	MRS: Setting function (setting/measurement server)	
	SRL: Serial communications	
uuu···u	User name that carried out alarm ACK (Up to 20 characters)	
_	Space	

Example

```
EA
01/05/11 12:20:00 001 1L 01/05/11 12:25:00, 01/05/11 12:25:00 KEY
  USER1234567890123456
01/05/11 12:30:00 A31 3t                  ,
EN
```

Message Summary

- The FL command is used to output the data.
- The message summary is output. Up to 250 messages are retained. Messages that exceed 250 are cleared from the oldest message.

Syntax

```
EACRLF
yy/mo/dd_hh:mm:ss_gg/nn_mmm···m_ppp_uuu···uCRLF
.................................
ENCRLF
```

yy	Year (00 to 99)
mo	Month (01 to 12)
dd	Day (01 to 31)
hh	Hour (00 to 23)
mi	Minute (00 to 59)
ss	Second (00 to 59)
gg	Message group number (01 to 08 (08: Free message))
nn	Message number (01 to 08)
mmm···m	Message (32 characters. Spaces are embedded when the number of characters is less than 32.)
ppp	Operation type KEY: Key operation REM: Remote control MRS: Setting function (setting/measurement server) SRL: Serial communications
uuu···u	User name (Up to 20 characters.)
_	Space

Example

```
EA
01/05/11 12:20:00 01/01 HelloHello-HelloHello-HelloHello KEY sh
01/05/11 12:20:00 03/05 morning                          KEY US
EN
```

Setting Change Log

- The FL command is used to output the log of setting changes in the internal memory.
- Up to 200 logs are retained in the internal memory. Logs that exceed 200 are cleared from the oldest log.

Syntax

```
EACRLF
yy/mo/dd_hh:mm:ss_xxxxxxxx_ppp_uuu···uCRLF
.................................
ENCRLF
```

yy	Year (00 to 99)
mo	Month (01 to 12)
dd	Day (01 to 31)
hh	Hour (00 to 23)
mm	Minute (00 to 59)
ss	Second (00 to 59)
xxx···x	File name (8 characters. Spaces are embedded when the number of characters is less than 8 characters.)
ppp	Operation type KEY: Key operation MRS: Setting function (setting/measurement server) SRL: Serial communications
uuu···u	User name (Up to 20 characters)
_	Space

Example

```
EA
01/05/11 12:20:00 51112200 KEY administrator4567890
01/05/11 12:30:00 51112300 MRS user1
EN
```

SNTP Log

- The FL command is used to output the data.
- The access log of the SNTP server is output. Up to 50 logs are retained in the internal memory. Logs that exceed 50 are cleared from the oldest data.

Syntax

```
EACRLF
yy/mo/dd_hh:mi:ss_nnn_xxxxxxxxxCRLF
.................................
ENCRLF
```

yy	Year (00 to 99)
mo	Month (01 to 12)
dd	Day (01 to 31)
hh	Hour (00 to 23)
mi	Minute (00 to 59)
ss	Second (00 to 59)
nnn	Error code All spaces: Success _ _1 to 999: Error code (See appendix 6.)

```
xxx···x     Detailed code (up to 9 characters)
            SUCCESS:       Success
            OVER:          Exceeds the deviation time.
            DORMANT:       Internal processing error
            HOSTNAME:      Failed to look up the host name.
            TCPIP:         Internal processing error
            SEND:          Failed to send the request, because the IP
                           address of the DXP was not assigned
                           correctly.
            TIMEOUT:       A response timeout occurred.
            BROKEN:        The response from the server is indefinite
                           data.
            LINK:          The data link is disconnected.
_   Space
```

Example

```
EA
03/11/10 11:40:00     SUCCESS
03/11/10 11:41:00     SUCCESS
03/11/10 11:45:00 292 HOSTNAME
EN
```

Status Information

- The IS command is used to output the data.
- The operation status of the DXP is output.
- For details related to the status information, see section 7.1, “The Bit Structure of the Status Information.”

Syntax

```
EACRLF
ddd.ccc.bbb.aaaCRLF
ENCRLF

  aaa      Status information 1 (000 to 255)
  bbb      Status information 2 (000 to 255)
  ccc      Status information 3 (000 to 255)
  ddd      Status information 4 (000 to 255)
```

Example

```
EA
000.000.032.000
EN
```

File List

- The ME command is used to output the data.
- The file list and the file data sizes of the specified directory on the DXP's external storage medium are output.
- Free space of the DXP's external storage medium is output.

Syntax

```
EACRLF
ffffffff_eee_ssssssss_yy/mo/dd_hh:mi:ssCRLF
.................................................
zzzzzzz_Kbyte_freeCRLF
ENCRLF
```

yy	Year (00 to 99)
ffffffff	File name (8 characters) When this is a directory, the characters <DIR> is shown at the position displaying the file data size.
eee	Extension (3 characters)
ssssssss	Data size of the file (_____0 to 99999999) [byte]
yy	Year (00 to 99)
mo	Month (01 to 12)
dd	Day (01 to 31)
hh	Hour (00 to 23)
mi	Minute (00 to 59)
ss	Second (00 to 59)
zzzzzzz	Free space on the medium (_____0 to 9999999)
_	Space

Example (File list)

```
EA
XV1      DEV      124 99/02/24 20:07:12      12310
XV1      PNL     1204 99/01/19 01:52:37
DATA            <DIR> 99/01/19 01:23:64
    523 Kbytes free
EN
```

Example (Check disk)

```
EA
    523 Kbytes free
EN
```

Relay Status

- The FD command is used to output the data.
- The ON/OFF status of the installed alarm output relay is output.

Syntax

```
EACRLF
I01-I06:aaaaaaCRLF
I11-I16:bbbbbbCRLF
I21-I26:ccccccCRLF
I31-I36:dddddCRLF
ENCRLF

  aaaaaa   The status* of I01, I02, I03, I04, I05, and I06 is
           indicated from the left.
  bbbbbb   The status* of I11, I12, I13, I14, I15, and I16 is
           indicated from the left.
  cccccc   The status* of I21, I22, I23, I24, I25, and I26 is
           indicated from the left.
  dddddd   The status* of I31, I32, I33, I34, I35, and I36 is
           indicated from the left.
           1 : Relay ON
           0 : Relay OFF
           - : Relay not installed
```

* Only the I01-I06 line is output for the DX100P; all four lines are output for the DX200P.

Example

```
For the DX200P
EA
I01-I06:1111--
I11-I16:1111--
I21-I26:------
I31-I36:------
EN
```

User Information

- The FU command is used to output the data.

When p1 = 0
Outputs the own user name, user level, and other information about the user currently logged in.

Syntax

```
EACRLF
p_l_uuu···uCRLF
sss_eeeeee_mmm_cCRLF
ENCRLF

p        Physical layer
         E: Ethernet
         S: RS-232 or RS-422A/485
l        User level
         A: Administrator
         U: User
```

```
uuu···u  User name (up to 20 characters)
         It is set to "serial" for serial communications.
         If the login function is not used and connection is
         established with the setting function or the monitor
         function via the Ethernet interface, it is set to "admin"
         or "user", respectively.
sss      Connected function
         SET:   Setting function
         MON:   Monitor function
eeeeee   User type
         ADMIN1 to ADMIN3:     Administrator 1 to administrator 3
         USER01 to USER90:     User 1 to user 90
         All spaces if the login function is not used or when using
         serial communications.
mmm      DXP mode
         OPE:   Operation mode
         ENG:   Engineering mode
         SYS:   System mode
c        Whether the logged-in user is specified to use the
         communication input data.
         C: Specified as a user to use the communication input data
         Space: Not specified as a user to use the communication
         input data
_        Space
```

Example

```
EA
E U uchiyama
MON USER01 OPE C
EN
```

When p1 = 1

Outputs the name and login information of all users that are logged in.

Syntax

```
EACRLF
nnCRLF
ppp_uuuuuuuuuuuuuuuuuuuuCRLF
...
ENCRLF
```

```
nn       The number of users logged in
ppp      Login information
         KEY:   Login using keys
         MSR:   Login to the setting function via the Ethernet
                interface
         ms_:   Login to the monitor function via the Ethernet
                interface (_: Underscore)
         FTP:   Login using FTP client
         TST:   Login to the setting function of the maintenance/
                test server
```

```
          ts_:   Login to the monitor function of the maintenance/
                 test server (_: Underscore)
          SRL:   Logs in via the serial interface
                 uuu···u User name (fixed to 20 characters)
_         Space
```

Example

```
EA
03
KEY UCHIYAMA
ms_ TSUCHIYA
ms_ YOSHINO
EN
```

When p1 = 2
Outputs the number of users that are logged in by each login method.

Syntax

```
EACRLF
KMSTFmtCRLF
ENCRLF

K: The number of users logged in using keys (0 or 1)
M: The number of users logged into the setting function via the
   serial interface (0 or 1)
S: The number of users logged in via the serial interface (0 or 1)
T: The number of users logged into the setting function of the
   maintenance/test server (0 or 1)
F: The number of users logged in using FTP client (0 to 2)
m: The number of users logged into the monitor function via the
   serial interface (0 to 2)
t: The number of users logged into the monitor connection of the
   maintenance/test server (0 or 1)
```

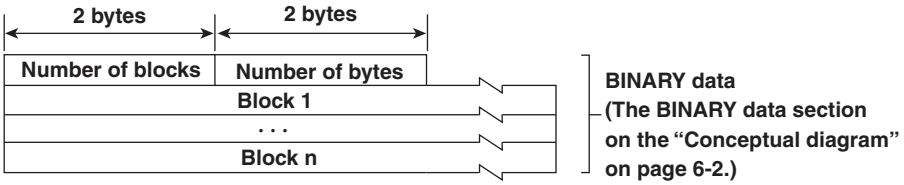
Example

```
EA
1000020
EN
```

6.3 Output Format of BINARY Data

Measured/Computed Data and FIFO Data

- The FD command is used to output the measured/computed data.
- The FF command is used to output the FIFO data.
- The ID number of the output format is “1.” See “Identifier” on page 6-3.



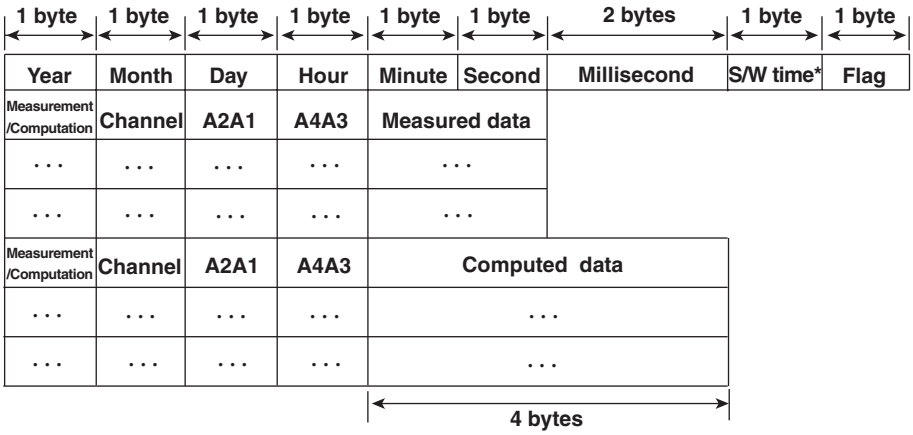
Number of blocks

This is the number of blocks.

Number of bytes

This is the size of one block in bytes.

Block



* Summer time or Winter time

Block member

Name	BINARY value
Year	0 to 99
Month	1 to 12
Day	1 to 31
Hour	0 to 23
Minute	0 to 59
Second	0 to 59
Millisecond	0 to 999
Summer, Winter	0, 1
Measurement/ Computation	00H : measurement, 80H : computation
Channel	01 to 60
Alarm status*	
A1 (Bit 0 to 3)	
A2 (Bit 4 to 7)	0 to 8
A3 (Bit 0 to 3)	
A4 (Bit 4 to 7)	

* BINARY value 0 to 8 is entered in the upper and lower 4 bits of a byte (8 bits) for the alarm status. The binary values 0 to 8 correspond to H (upper limit alarm), L (lower limit alarm), h (difference upper-limit alarm), l (difference lower-limit alarm), R (upper limit on rate-of-change alarm), r (lower limit on rate-of-change alarm), T (delay upper limit alarm), and t (delay lower limit alarm) as follows:

0: no alarm, 1: H, 2: L, 3: h, 4: l, 5: R, 6: r, 7: T, and 8: t.

- **Flag**

  The meaning of the flags are given on the table below. The flags are valid during FIFO data output. The flags are undefined for other cases.

Bit	Flag 0	Flag 1	Meaning of the flag
7	No	Yes	Indicates that the screen snap shot was executed.
6	No	Yes	Sum check
5	–	–	
4	–	–	
3	–	–	
2	No	Yes	Indicates that the decimal position or unit information was changed during measurement.
1	No	Yes	Indicates that the acquiring interval to the FIFO buffer was changed.
0	No	Yes	Indicates that the internal process (computation, for example) took too much time and that the measurement could not keep up at the specified scan interval.

The flags that have "–" for the flag column are not used. The value is undefined.

- **Measured/computed data**

  The FD and FF commands output the mantissa of the measured/computed data. The measured data is a 16-bit signed integer; the computed data is a 32-bit signed integer. By combining with the decimal position information obtained with the FE command, the correct measured/computed data can be derived.

Binary value (Integer)	Decimal position code	Measured value	Binary value (Integer)	Decimal position code	Measured value
10000	0	10000	10000	3	10.000
10000	1	1000.0	10000	4	1.0000
10000	2	100.00			

- **Special data value**

  The measured/computed data take on the following values under special conditions.

Special data value	Measured data	Computed data
+ over	7FFFH	7FFF7FFFH
– over	8001H	8001H8001H
Skip	8002H	8002H8002H
Error	8004H	8004H8004H
Undefined	8005H	8005H8005H

Note

The number of blocks, number of bytes, and measured/computed data are output according to the byte order specified with the BO command.

7.1 The Bit Structure of the Status Information

The following four groups of status information are output in response to a status information output request using the IS command. Status information 1 and 2 are cleared when they are output. Status information 3 and 4 are not cleared when it is output, and remains at “1” while the event is occurring.
For the output format, see “Status Information” in section 6.2, “Output Format of ASCII Data.”

Status Information 1

Bit	Name	Description
0	A/D conversion complete	Set to “1” when the A/D conversion of the measurement is complete.
1	Medium access complete	Set to “1” when the display, event, manual sampled, report, TLOG, or screen image data file are finished being saved to the external storage medium. Set to “1” when setting data is successfully saved or loaded.
2	Report generation complete	Set to “1” when report generation is complete.
3	Timeout	Set to “1” when the timer expires.
4 to 5	–	–
6	USER key detection	Set to “1” when the USER key is pressed.
7	–	–

Status Information 2

Bit	Name	Description
0	Measurement drop	Set to “1” when the measurement process could not keep up.
1	Decimal/unit information change	Set to “1” when the decimal/unit information is changed.
2	Command error	Set to “1” when there is a command syntax error.
3	Execution error	Set to “1” when an error occurs during command execution.
4	SNTP error when starting data acquisition	Set to “1” when the time could not be adjusted using SNTP when data acquisition is started.
5 to 7	–	–

Status Information 3

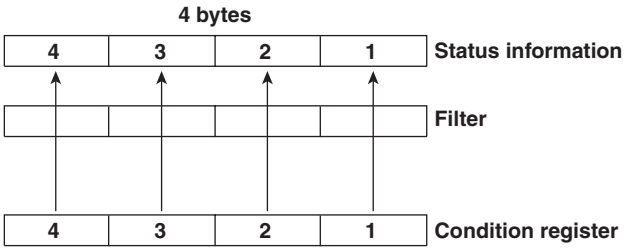
Bit	Name	Description
0	–	–
1	–	–
2	Memory end	Set to “1” while the following condition is true. • When the free space on the storage medium is less than or equal to 10% or 6 MB if the storage area of the external storage medium is not used cyclically (Media FIFO). • When an error is detected in the storage medium if the storage area of the external storage medium is used cyclically (Media FIFO). • When the remaining amount of time of the internal memory (time until overwriting starts) is less than or equal to the specified time (memory alarm time) if an external storage medium is not inserted in the drive.
3	Logged in	Set to “1” when logged in using keys, logged into the setting function via the Ethernet interface, or logged in via the serial interface.
4	Login not allowed	Set to “1” while login using keys, login to the setting function via the Ethernet interface, or login via the serial interface are not allowed.
5 to 7	–	–

Status Information 4

Bit	Name	Description
0	System mode	Set to “1” during system mode.
1	Memory sampling	Set to “1” while data are being acquired into the internal memory.
2	Computing	Set to “1” only when computation is executed.
3	Alarm generating	Set to “1” while the alarm is occurring.
4	Accessing medium	Set to “1” while the display, event, manual sampled, report, TLOG, or screen image data file are being saved to the external storage medium.
5	Activating e-mail	Set to “1” while the e-mail function is engaged.
6	User lock ACK not executed	Set to “1” only when the user lock ACK operation has not been carried out (user lock icon is displayed).
7	–	–

7.2 Status Information and Filter

The IF command can be used to set the filter. The following figure depicts the status information and filter on this instrument.



- When a status indicated on the previous page is entered, the corresponding bit in the condition register is set to “1.” The logical AND of the condition register and the filter becomes the status information.
- When multiple connections are up, filters can be specified for the individual connection. Therefore, the status information can be held for each connection.

Appendix 1 ASCII Character Codes

Upper 4 bits

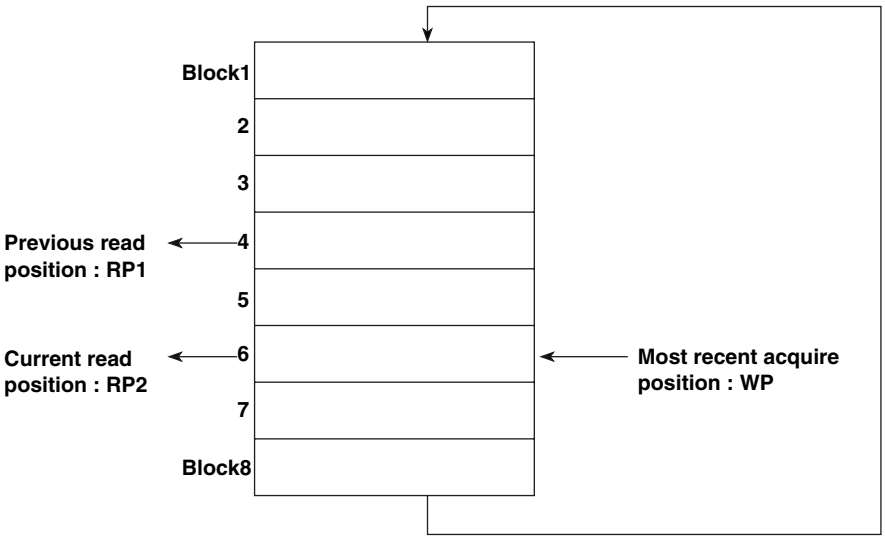
Lower 4 bits	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P		p								
1				1	A	Q	a	q								
2				2	B	R	b	r								
3			#	3	C	S	c	s								
4				4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7				7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A	LF		*	:	J	Z	j	z								
B		ESC	+		K		k									
C					L		l									
D	CR		–		M		m									
E			.		N	°	n									
F			/		O	_	o									

Appendix 2 Output Flow of FIFO Data

Overview of the FIFO Buffer

The DXP has a dedicated buffer for outputting measured/computed data. Measured/computed data are constantly acquired to the buffer at the specified interval (the acquiring interval to the FIFO buffer, specified by the FR command). The oldest data are overwritten by the newest data (First-In-First-Out). By using this function, it is possible to read measured/computed data that have been sampled at the specified intervals regardless of the frequency at which the PC periodically reads the measured/computed data.

The following example shows the case when the acquiring interval to the FIFO buffer is 1 s and the capacity of the FIFO buffer is for 8 intervals.



- Acquiring the measured/computed data
  - The measured/computed data are acquired to the buffer at 1 s intervals.
  - Measured/computed data are acquired to blocks 1 through 8 in order. After acquiring to block 8, the next acquiring operation returns to block 1.

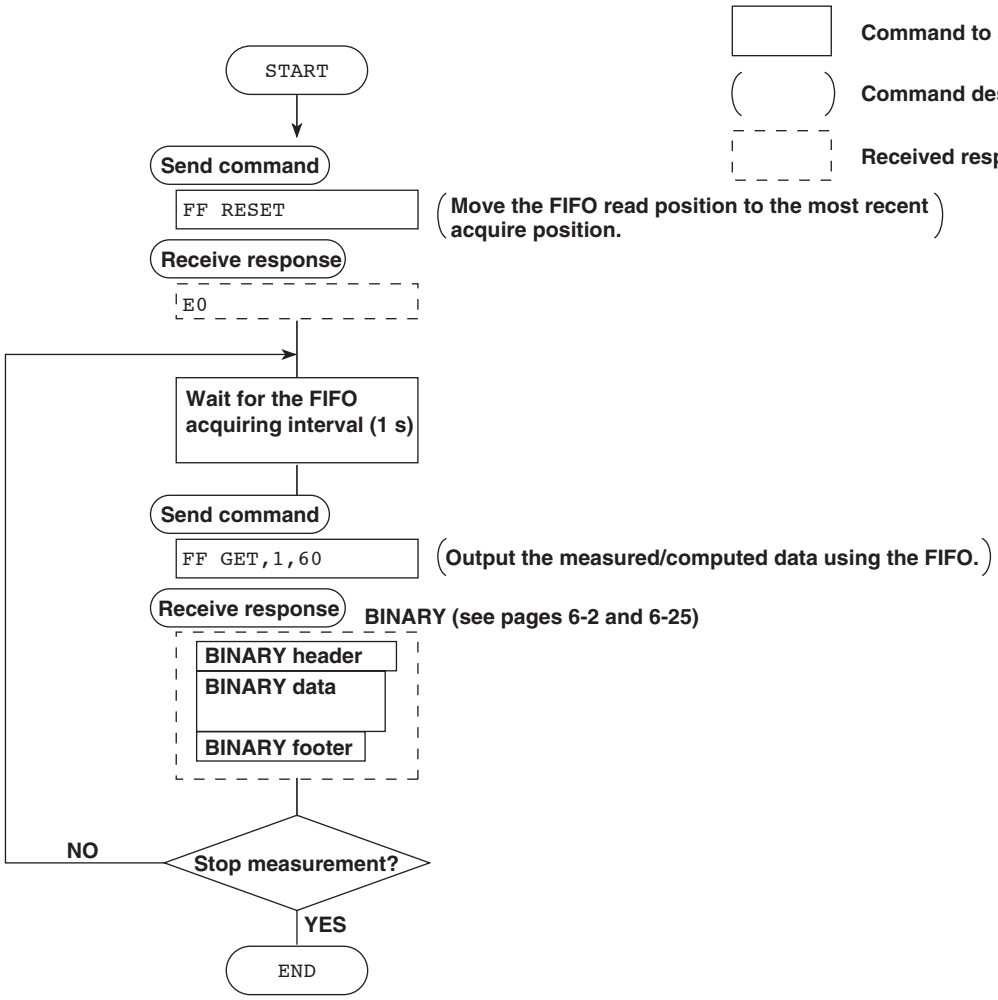
- Reading the measured/computed data (FF GET command)
  Outputs the data from the next to the previous read position (RP1) to the most recent acquire position (WP).
  In this example, more than 2 s has elapsed from the previous read operation. Therefore, data in blocks 5 and 6 are output.

- Reading the measured/computed data (FF GETNEW command)
  Output the specified number of blocks of FIFO data back starting from the recent acquire position (WP).
  In this example, if you specify the number of blocks to “5,” data in blocks 2 to 6 are output.

The capacity of the FIFO buffer (number of data sets that the FIFO buffer can hold, number of the blocks in above example) varies depending on the model.

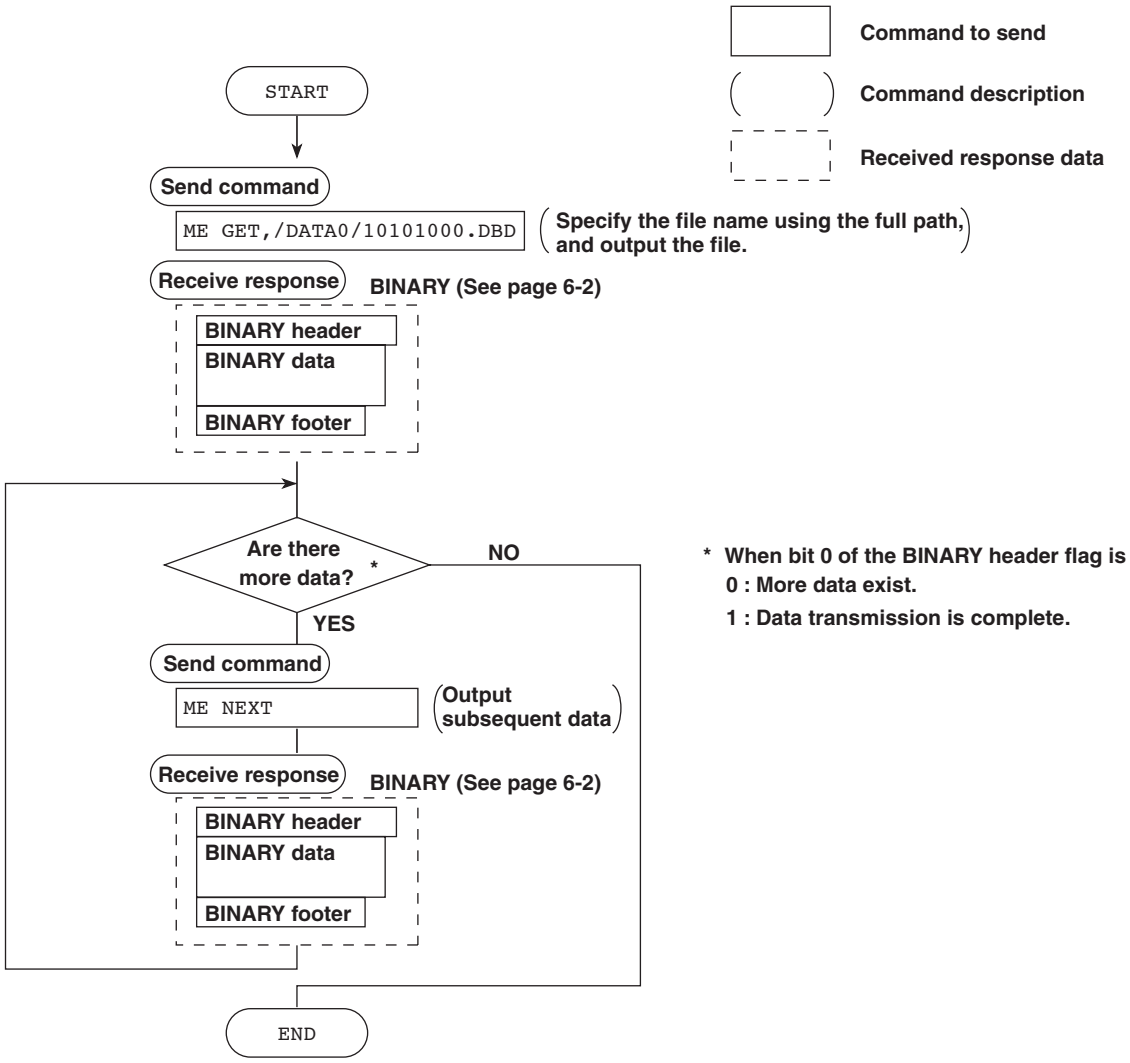
- DX102P/DX104P/DX204P/DX208P
  240 intervals (30 s at an acquiring interval of 125 ms)
- DX106P/DX112P/DX210P/DX220P/DX230P
  60 intervals (60 s at an acquiring interval of 1 s)

Example in Which the FIFO Acquiring Interval on the DX230P is 1 s and the Measured/ Computed Data from CH1 to CH60 are Continuously Output Using the FIFO Function



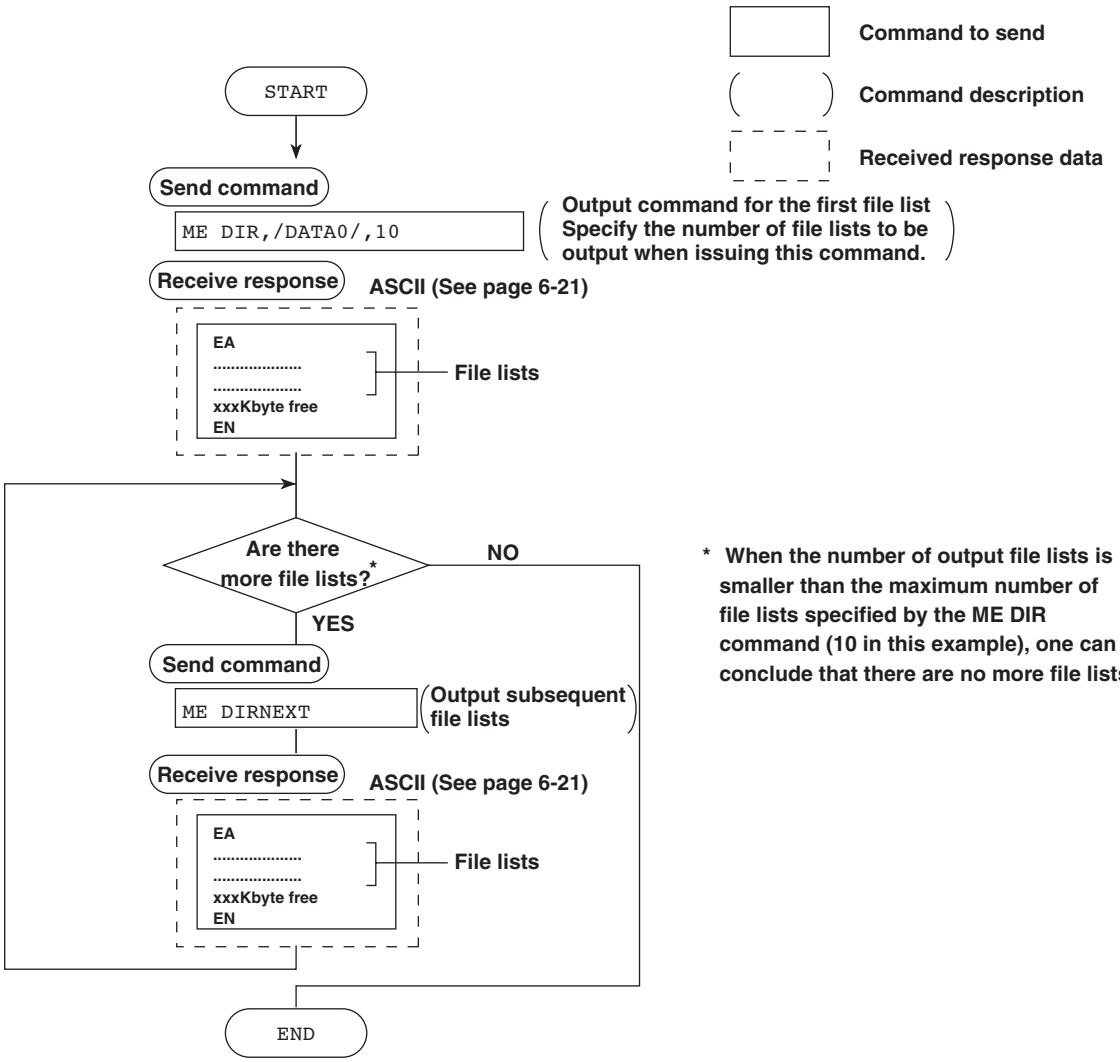
Appendix 3 Output Flow of the File or the File List in the External Storage Medium

Example in which the file 10101000.DBD in the DATA0 directory is output



* When bit 0 of the BINARY header flag is
0 : More data exist.
1 : Data transmission is complete.

Example in which the file list belonging to directory DATA0 is output 10 files at a time

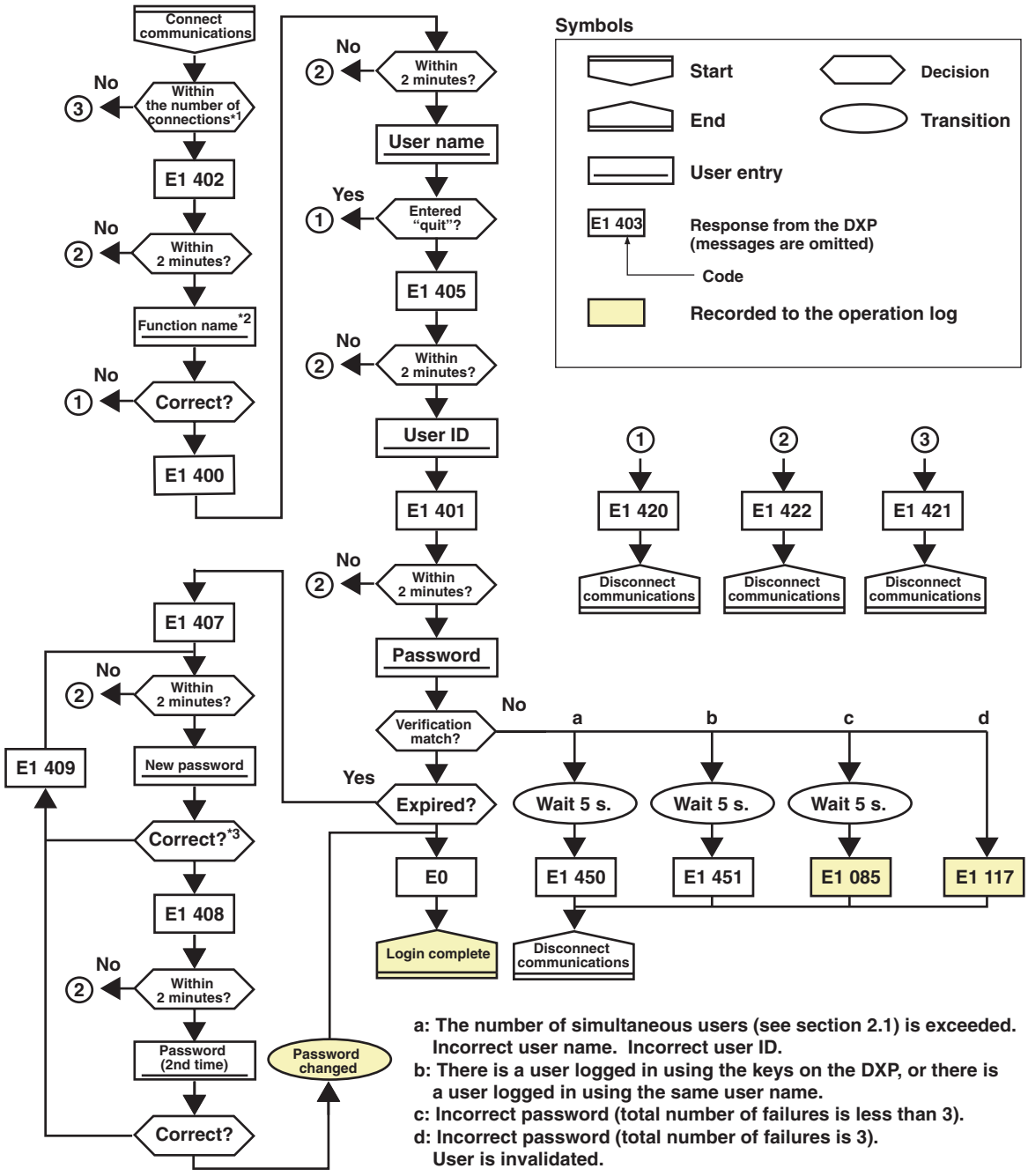


* When the number of output file lists is smaller than the maximum number of file lists specified by the ME DIR command (10 in this example), one can conclude that there are no more file lists.

Appendix 4 Login Process and Messages during the Login Process

To use the setting/measurement server or the maintenance/test server via the Ethernet interface, the user logs into the DXP from the PC. If you complete the process successfully up to login complete in the following figure, the commands in become functional.

When Using the Login Function of the DXP



a: The number of simultaneous users (see section 2.1) is exceeded. Incorrect user name. Incorrect user ID.
b: There is a user logged in using the keys on the DXP, or there is a user logged in using the same user name.
c: Incorrect password (total number of failures is less than 3).
d: Incorrect password (total number of failures is 3). User is invalidated.

*1 Connections cannot exceed the maximum number of connections (see section 2.1).
*2 "setting" or "monitor".
*3 Enter the password using 6 to 8 alphanumeric characters. Spaces cannot be used. Passwords used in the past are not allowed.

Messages during the Login Process

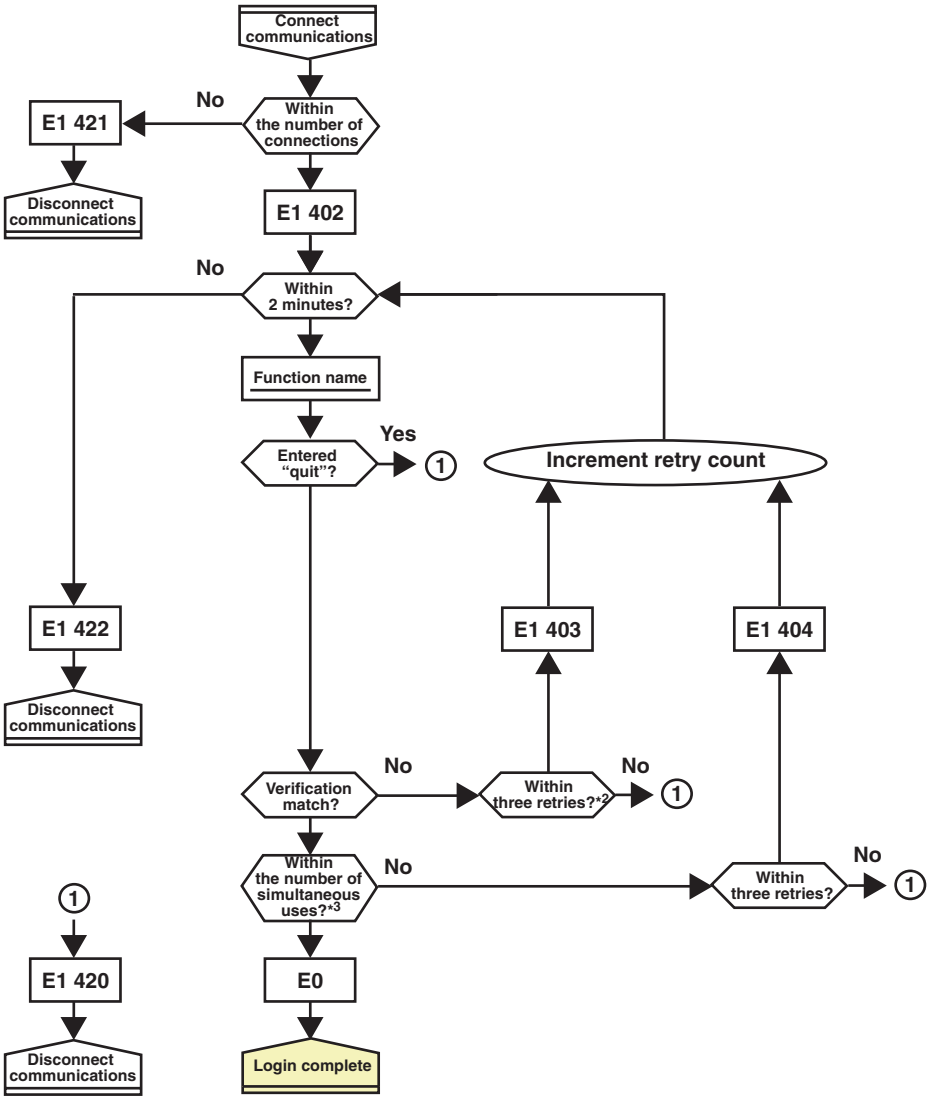
An English error message is returned via the communication interface. Codes other than 085 and 117 are not displayed on the DX100P/DX200P screen.

Code	Message and Description
085	The login password is incorrect. The password is incorrect. Check the password.
117	This password is not effective. The user is invalidated. If the login operation is carried out with a wrong password for three consecutive times, the user is invalidated. From that point, the user can no longer log in. Clearing the user locked condition Administrators can clear the user locked condition. For the procedure, see section 6.1 in the DX100P/DX200P User's Manual.
400	Input username. Enter a user name that is registered in the DXP.
401	Input password. Enter the password.
402	Select function from 'setting' or 'monitor'. Specify the function to be connected, "setting" or "monitor".
403	Login incorrect, try again! Login failed. Restart from the user name.
404	No more login at the specified level is acceptable. Attempting to connect exceeding the number of simultaneous connections allowed (setting function: 1, monitor function: up to 2). Connect to a different function or use "quit" to exit.
405	Input user ID. Input user ID.
407	Password has expired. Please enter a new password. The password is expired. Enter a new password.
408	Enter password again for confirmation. Reenter the password for confirmation.
409	This password is not correct or was already used. The password is incorrect. Or, the password has been used in the past. The combinations of user IDs and passwords that are identical to those specified by other users or those that have been registered in the past cannot be specified. Enter the password using 6 to 8 alphanumeric characters. Spaces cannot be used for the password.
420	Connection has been lost. The specified function name (setting or monitor) is incorrect. Or, "quit" was used for the user name. Communication has been disconnected. Enter the correct function name using lowercase letters. You cannot use "quit" as a user name.
421	The number of simultaneous connection has been exceeded. Attempted to connect exceeding the maximum number of simultaneous connections. Drop other connections first.
422	Communication has timed-out. Connection has been dropped due to communication timeout. Enter the function name, user name, user ID, and password within two minutes.
450	This entry is incorrect. User information is incorrect. Communication has been disconnected. Check the user name, user ID, and password.
451	Login prohibited because another user is logged in. There is a user with the same user name already logged into the setting/measurement server, maintenance/test server, or FTP server. Or, there is a user logged in using keys on the DXP (administrator or user) when attempting to log into the setting function of the setting/measurement server. Check the login status.

When Not Using the Login Function of the DXP

Log in using “setting”, “admin”, “monitor”, or “user” for the function name.

- If you use “setting” or “admin”, you log into the setting function.
- If you use “monitor” or “user”, you log into the monitor function.

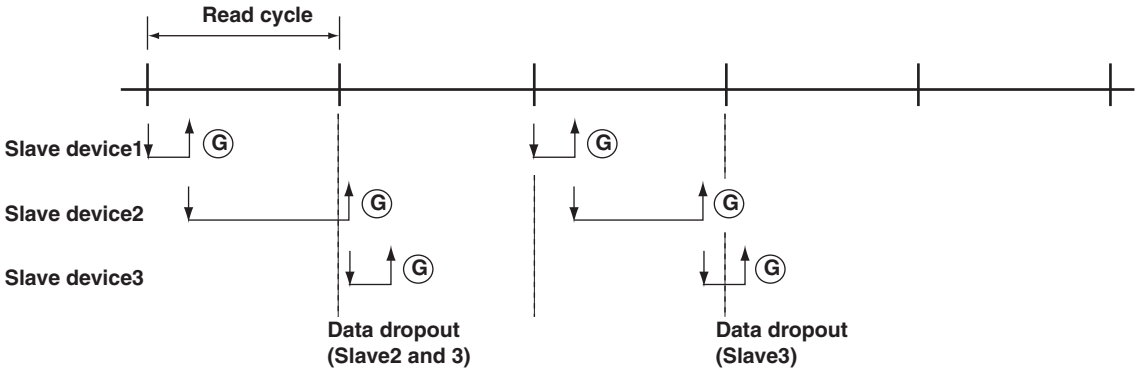


For a description of error messages, see the previous page.

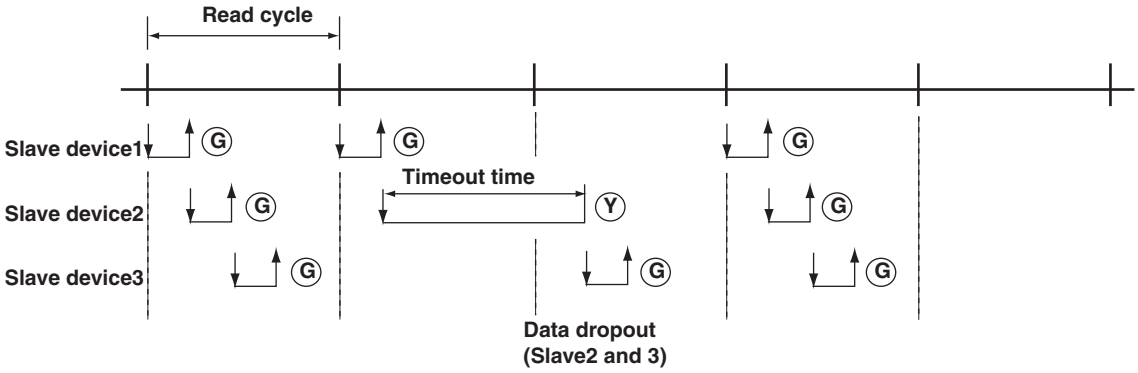
Appendix 5 Data Dropout (Modbus Master)

If the DXP does not have received the response from the slave device corresponding to the command it transmitted until the time for the next command transmission, data dropout occurs. Take appropriate measures referring to the figures below.

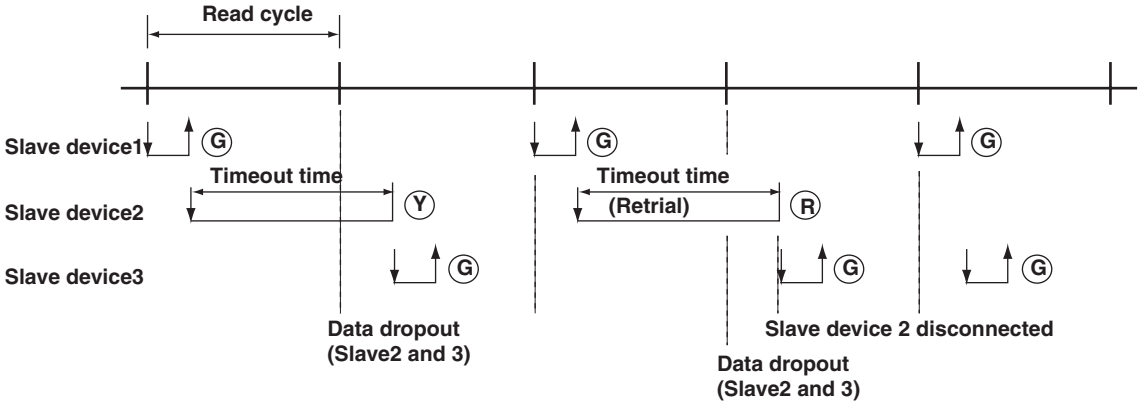
1. When slave deice takes time to respond



2. When slave device does not respond



3. When slave device is disconnected (Number of retrials is set to "1")



Ⓖ Ⓨ Ⓡ: Status lamp, G: Green, Y: Yellow, R: Red

↓ : Command from the DXP

↑ : Response from slave device

App

Appendix

Appendix 6 A List of Error Messages

The list of error codes and messages is given below.

Errors Related to Parameter Settings

• Setting Errors

Code	Message	Explanation/Countermeasures/Ref. section
1	System error.	Contact your nearest YOKOGAWA dealer.
2	Incorrect date or time setting.	See section 5.15.*1
3	A disabled channel is selected.	See section 5.3.
4	Incorrect function parameter.	See section 5.3.
5	The input numerical value exceeds the set range.	Enter a proper value.
6	Incorrect input character string.	Enter a proper character string.
7	Too many characters.	Enter specified number of characters.
8	Incorrect input mode.	See section 5.1.*1
9	Incorrect input range code.	See section 5.1.*1
21	Cannot set an alarm for a skipped channel.	See section 5.1.*1
22	The upper and lower span limits are equal.	See section 5.1.*1
23	The upper and lower scale limits are equal.	See section 5.1.*1
30	The partial boundary value exceeds the range of the span.	See section 5.11.*1
31	Partial expansion display is set ON for a SKIPPED channel.	See section 5.1.
35	The upper and lower limits of the display band are equal.	See section 5.11.*1
36	The lower limit of the display band is greater than the upper limit.	See section 5.11.*1
37	The display band is narrower than 4% of the entire display.	See section 5.11.*1
40	Incorrect group set character string.	See section 5.9.*1
41	There is no specified input channel.	Check the number of input channels.
42	Exceeded the number of channels which can be set.	Check the number of input channels.
43	A channel number cannot repeat in a group.	See section 5.9.*1
45	There is no character string saved in the clipboard.	Copy a character string to the clipboard.
46	The character string saved in the clipboard is too long.	Paste a character string with the specified number of characters.
61	There is no channel specified by the MATH expression.	See section 5.18.*1
62	MATH expression grammar is incorrect.	See section 5.18.*1
63	MATH expression sequence is incorrect.	See section 5.18.*1
64	MATH upper and lower span values are equal.	See section 5.18.*1
70	MATH constant description is incorrect.	See section 5.18.*1
71	The range of the MATH constant is exceeded.	See section 5.18.*1
80	This username is already registered.	See section 4.4.*1
81	All space or ‘quit’ string cannot be specified.	See section 4.4.*1
83	Duplicate used combination of user ID and password.	See section 4.4.*1
85	The login password is incorrect.	See section 6.1.*1
86	The key-lock release password is incorrect.	–
87	This key is locked.	See section 4.4.*1
88	This function is locked.	See section 4.4.*1
89	Press [FUNC] key to login.	See section 6.1.*1
90	No permission to enter to the SETUP mode.	–
91	Password is incorrect.	Enter the correct password. See sections 6.1 and 6.3.*1

*1 See the DX100P/DX200P User’s Manual (IM04L05A01-01E, IM04L06A01-01E).

Code	Message	Explanation/Countermeasures/Ref. section
92	Press [ESC] key to change to the operation mode.	Press the ESC key.
93	String including space or all space cannot be specified.	Spaces are not allowed in the Web user name and password.
94	More than one address cannot be specified.	Multiple addresses cannot be specified. Only a single sender is allowed.
95	This function is locked.	Unlock the function. See section 4.4.*1
100	IP address doesn't belong to class A, B, or C.	See section 2.3.
101	The result of the masked IP address is all 0s or 1s.	See section 2.3.
102	SUBNET mask is incorrect.	See section 2.3.
103	The net part of default gateway is not equal to that of IP address.	See section 2.3.
110	This user name is not registered.	Enter a registered user name. See sections 4.4 and 6.1.*1
111	The login user ID is incorrect.	Enter the correct user ID. See sections 4.4, 6.1, and 6.3.*1
112	Password must use more than 6 alphanumeric characters.	A space or spaces cannot be used. See section 6.1.*1
113	Password entered is incorrect.	Enter the correct password. See sections 6.1 and 8.10.*1
114	This user name is invalid.	Use a valid user name.
115	Relay behavior Hold and Indicator Nonhold can not be selected.	See section 4.1.*1
116	This user name cannot be specified.	See section 4.4.*1
117	This password is not effective.	See section 6.1.*1
118	You are logged out, because of invalid access.	Register the user again. See section 4.4.*1
119	This user name is unable to use this mode.	Use other user name to log in. See section 4.4.*1
120	Measured value is incorrect. (in ascending order)	See section 5.21.*1
121	A user is already logged in.	See section 1.5.*1
122	Measured value exceeds the range setting.	See section 5.21.*1
123	Measure function cannot be used until range settings are stored.	See section 5.21.*1
124	Password entry cannot be performed.	Errors when entering characters using barcode. Section 3.7
125	Character entry cannot be performed.	Errors when entering characters using barcode. Section 3.7

• Execution Errors

Code	Message	Explanation/Countermeasures/Ref. section
150	This action is not possible because sampling is in progress.	Execute Memory Stop if the action is necessary.
151	This action is not possible during sampling or calculating.	Execute Memory Stop or stop computation if the action is necessary.
152	This action is not possible because saving is in progress.	Wait till the saving ends.
153	This action is not possible because formatting is in progress.	-
155	The message is not written while sampling is stopped.	Messages can be written after Memory Start.
157	This function is not possible at this time.	-
158	Exceeds time deviation setting.	Set a time within the deviation time. See section 4.15.*1
170	End process can't proceed, because setting file is not saved to Media.	Check the external storage medium. See section 3.5.*1
171	The selected configuration file is not compatible with this system.	Select other configuration file.
172	Data save is not possible in the current operating mode.	Save engineering mode settings first. See section 5.24.*1
173	Data save is not possible because of insufficient media capacity.	Use another storage medium. See section 5.24.*1

Operation Errors

• Errors Related to External Storage Medium

Code	Message	Explanation/Countermeasures/Ref. section
200	Operation aborted because an error was found on media.	Check the storage medium.
201	Not enough free space on media.	Use another storage medium.
202	Media is read-only.	Release the write protection.
210	Media has not been inserted.	Insert a storage medium into the drive.
211	Media is damaged or not formatted.	Use another storage medium or carry out formatting.
212	Format error.	Try formatting again or use another storage medium.
213	The file is read-only.	Access to other files or make the file write-enable.
214	There is no file or directory.	See section 5.3.
215	Exceeded the allowable number of files.	Delete files or change storage medium.
216	The file or directory name is incorrect.	See sections 4.11, 4.12, 5.7 and 5.21.*1
217	Unknown file type.	Access to other files.
218	Directory exists. Delete the directory or change directory name.	See section 5.7.*1
219	Invalid file or directory operation.	Cannot handle files and directories in the 2nd and deeper layers.
220	The file is already in use. Try again later.	Wait till file is free.
230	There is no setting file.	Access to other files.
231	Abnormal setting exists in file.	Access to other files.

*1 See the DX100P/DX200P User's Manual (IM04L05A01-01E, IM04L06A01-01E).

• Errors Related to Historical Trend

Code	Message	Explanation/Countermeasures/Ref. section
232	There is no available data.	This message may appear when recalling historical trend. Access to other files.
233	The specified historical data do not exist.	This message may appear when recalling historical trend.
234	The specified channel is not assigned to the display group.	This message may appear when switching to trend or bar graph from overview. See section 5.9.*1

*1 See the DX100P/DX200P User's Manual (IM04L05A01-01E, IM04L06A01-01E).

• Errors Related to Sign Record

Code	Message	Explanation/Countermeasures/Ref. section
240	You cannot sign this record, because a signature is already present .	Sign at the same authority level is allowed once.
243	This file is not allowed to sign record.	Only files saved at Memory Stop can be signed.
244	Data is damaged or changed.	You cannot sign this file.
245	This function cannot be used in the record signature display.	End the sign record screen. See sections 6.3.*1
246	This function cannot be used due to no data file saved in media.	Check the external storage medium.
247	This function cannot be used in the engineering mode display.	End the engineering mode. See section 3.5.*1
248	Signature function cannot be performed.	Check the external storage medium.

*1 See the DX100P/DX200P User's Manual (IM04L05A01-01E, IM04L06A01-01E).

• Errors Related to E-mail and Web server

Code	Message	Explanation/Countermeasures/Ref. section
260	IP address is not set or ethernet function is not available.	The IP address is not specified. Check the IP address.
261	SMTP server is not found.	Occurs when the SMTP server is specified by name. • Check the DNS setting. • Check the SMTP server name.
262	Cannot initiate E-mail transmission.	• The host name of the DXP is not correct. Check the host name. • The port number for SMTP server is not correct. Check the port number.
263	Sender's address rejected by the server.	Check the sender's address.
264	Some recipients' addresses are invalid.	Check the recipient's address.
265	SMTP protocol error.	May occur if a network failure (cable problems, duplicate addresses, network device failure, and so on) occurs in the middle of the e-mail transmission.
266	Ethernet cable is not connected.	Check the cable connection.
267	Could not connect to SMTP server.	• Check to see that the SMTP server is connected to the network. • If the SMTP server name is specified using an IP address, check to see that the IP address is correct.
268	E-mail transmission request failed.	Contact your nearest YOKOGAWA dealer.
269	E-mail transfer error.	May occur if a network failure (cable problems, duplicate addresses, network device failure, and so on) occurs in the middle of the e-mail transmission.
275	The current image cannot be output to the Web.	The setup screen cannot be output to the Web. This message is displayed on the Web screen.
276	Image data currently being created. Unable to perform key operation.	Try again a little later. This message is displayed on the Web screen.
277	Could not output screen to Web.	Failed to create the image. This message is displayed on the Web screen.
278	Web control denied because a user has control.	If there is a user logged in using the keys on the DXP or if there is a user logged into the setting function of the setting/measurement server of the DXP via the communication interface, you cannot operate the DXP from the browser.

• Errors Related to FTP Client

An error messages returned via the communication interface does not include “Character Strings” in the table. They are displayed on the FTP log screen of the DXP. FTP logs can be output via the communication.

Code	Message
280	IP address is not set or FTP function is not available. Further details are provided by the character string that appears after error code 280.

Character String and Details	
HOSTADDR	The DXP’s IP address has not been specified. Check the IP address.
DORMANT	Internal processing error.*1
LINK	Data link is disconnected. Check the cable connection.

Code	Message
281	FTP mail box operation error. Further details are provided by the character string that appears after error code 281.

Character String and Details	
MAIL	Internal processing error.*1
STATUS	Internal processing error.*1
TIMEOUT	Internal processing error.*1
PRIORITY	Internal processing error.*1
NVRAM	Internal processing error.*1

Code	Message
282	FTP control connection error. Further details are provided by the character string that appears after error code 282.

Character String and Details	
HOSTNAME	Failed the DNS lookup (search the IP address corresponding to the host name). Check the DNS setting and the destination host name.
TCPIP	Internal processing error.*1
UNREACH	Failed to connect to a control connection server. Check the address setting and that the server is running.
OOBINLINE	Internal processing error.*1
NAME	Internal processing error.*1
CTRL	The control connection does not exist. Check that the server does not drop the connection and that it responds within the proper time period.
IAC	Failed to respond in the TELNET sequence. Check that the server does not drop the connection and that it responds within the proper time period.
ECHO	Failed to transmit data on the control connection. Check that the server does not drop the connection and that it responds within the proper time period.
REPLY	Failed to receive data on the control connection. Check that the server does not drop the connection and that it responds within the proper time period.
SERVER	The server is not in a condition to provide the service. Check that the server is in a condition in which service can be provided.

Code	Message
283	FTP command was not accepted. Further details are provided by the character string that appears after error code 283.

Character String and Details	
USER	Failed user name verification. Check the user name setting.
PASS	Failed password verification Check the password setting.
ACCT	Failed account verification. Check the account setting.
TYPE	Failed to change the transfer type. Check that the server supports the binary transfer mode.
CWD	Failed to change the directory. Check the initial path setting.
PORT	Failed to set the transfer connection. Check that the security function is disabled.
PASV	Failed to set the transfer connection. Check that the server supports PASV commands.
SCAN	Failed to read the transfer connection settings. Check that proper response to the PASV command is received from the server.

Code	Message
284	FTP transfer setting error. Further details are provided by the character string that appears after error code 284.

Character String and Details	
MODE	Internal processing error.*1
LOCAL	Internal processing error.*1
REMOTE	The destination file name is not correct. Check that you have the authority to create or overwrite files.
ABORT	File transfer abort was requested by the server. Check the server for the reason for the abort request.

*1 Contact your nearest YOKOGAWA dealer.

Code	Message
285	FTP data connection error. Further details are provided by the character string that appears after error code 285.

Character String and Details	
SOCKET	Failed to create a socket for the transfer connection.*2
BIND	Failed the transfer connection command.*2
CONNECT	Failed the transfer connection.*2
LISTEN	Failed the transfer connection reception.*2
ACCEPT	Failed to accept the transfer connection.*2
SOCKNAME	Internal processing error.*2
RECV	Failed to receive data over the transfer connection.*2
SEND	Failed to send data over the transfer connection.*2

Code	Message
287	FTP is failed because of file acquirement from external media.

*2 These errors may occur if the network experiences trouble during the data transmission (bad cable connection, duplicate addresses, network equipment failure).

Note

- The FTP client function on the DX100P/DX200P has a timer function that drops the connection if there is no data transfer for two minutes. If the server does not respond within this time period, the transfer fails.
- The FTP client function on the DX100P/DX200P may overwrite the file of the same name in the destinaton directory without warning, unless the server returns a denial response.

Errors Related to SNTP Client

290 SNTP access failure.

Further details are provided by the character string that appears after error code 290.

Character String and Details
DORMANT Internal processing error.*1
LINK The link is dropped. Check the cable connection.

291 SNTP server does not respond.

Further details are provided by the character string that appears after error code 291.

Character String and Details
TIMEOUT Confirm the SNTP server is in service.*2

292 Incorrect SNTP server setting.

Further details are provided by the character string that appears after error code 292.

Character String and Details
HOSTNAME Failed to specify the IP address from a hostname using the DNS. Check the DNS settings and the name of the SNTP server.
TCPIP Internal processing error.*1

293 Invalid SNTP server reply.

Further details are provided by the character string that appears after error code 293.

Character String and Details
SEND The DXP's IP address has not been specified correctly. Check the IP address.
BROKEN Access to the SNTP server manually several times. If this error occurs check the SNTP server.

294 No time correction because excess time deviation with SNTP server.

Further details are provided by the character string that appears after error code 294.

Character String and Details
OVER This error occurs when a periodic time adjustment does not operate because the time deviation between the time of the DXP internal clock and the SNTP server exceeds ten minutes. Check the time on the DXP and the SNTP server.

*1 Contact your nearest YOKOGAWA dealer.

*2 These errors may occur if the network experiences trouble during the data transmission (bad cable connection, duplicate addresses, network equipment failure).

Communication Errors

An English error message is returned via the communication interface. It is not displayed on the screen.

- **Errors Related to Engineering Mode Setting, System Mode Setting, Control, and Output Command Execution**

Code	Message
300	Command is too long.
301	Too many number of commands delimited with ';'.
302	This command has not been defined.
303	Data request command can not be enumerated with sub-delimiter.
350	Command is not permitted to the current user level.
351	This command cannot be specified in the current mode.
352	The option is not installed.
353	This command cannot be specified in the current setting.
354	This command is not available during sampling or calculating.
360	Output interface must be chosen from Ethernet or Serial.
362	There are no data to send 'NEXT' or 'RESEND'.
363	All data have already been transferred.
367	Password change denied because another user is logged in.

• Maintenance and Test Communication Command Errors

An English error message is returned via the communication interface. It is not displayed on the screen.

Code	Message
390	Command error.
391	Delimiter error.
392	Parameter error.
393	No permission.
394	No such connection.
395	Use 'quit' to close this connection.
396	Failed to disconnect.
397	No TCP control block.

• Other Communication Errors

See appendix 4.

• Status Messages

Code	Message
559	This command must be used with LL command.

• Cautions

Code	Message	Ref. section
600	Measured data and Settings have been initialized.	See section 4.13.*1
601	Measured data have been initialized.	See sections 4.13 and 3.5.*1
610	This user name is already registered.	See section 4.4.*1
611	There is no user who can enter to the SETUP mode.	–
612	Please acknowledge all active alarms before stopping this record.	See section 8.12.*1
613	You can't sign this record because of being made by memory time up.	See sections 1.4 and 1.5.*1
614	Calibration settings are reset because of range setting change.	See section 5.21.*1
615	Setting changes are aborted while data is saved.	See section 3.4.*1

*1 See the DX100P/DX200P User's Manual (IM04L05A01-01E, IM04L06A01-01E).

Index

A

access control 2-32
access interval 2-59
access reference time 2-59
access timeout 2-59
account 2-10
address 3-10, 4-4, 4-6
affirmative response 6-1
alarm ACK 2-41
arrow key iv
ASCII character code App-1
ASCII Output 6-2

B

barcode input 1-13
barcode reader 3-16
baud rate 3-10, 4-4
BINARY data section 6-2
BINARY data type 6-3
BINARY footer section 6-2
BINARY header section 6-2
BINARY Output 6-2
bit structure 3-9
bit structure of the status information 7-1, 7-2
block (measured/computed/FIFO data) 6-25
block member 6-25
browser 2-36

C

cable 3-5
cable connection procedure 3-5
calculating the sum value 6-4
canceling operation vii
carriage return code App-1
character/number input key iv
checking the connection status 2-9
command
- AK 5-30
- all 2-57
- BB 5-31
- BC 5-31
- BD 5-16
- BE 5-32
- BF 5-27
- BG 5-16
- BH 5-16
- BI 5-18
- BJ 5-31
- BK 5-27
- BL 5-16
- BM 5-27
- BN 5-26
- BO 5-35
- BP 5-34
- BQ 5-31
- BR 5-22
- BS 5-26
- BV 5-34
- BW 5-27
- CC 5-28
- CL 5-33
- close 5-38
- CM 5-31
- con 5-38
- CS 5-35
- EC 5-33
- EE 5-28
- EF 5-25
- EG 5-25
- EH 5-16
- EI 5-28
- EJ 5-31
- EK 5-26
- EL 5-27
- EM 5-31
- EQ 5-23
- ESC C 5-38
- ESC O 5-38
- eth 5-39
- EV 5-30
- FC 5-35
- FD 5-35
- FE 5-35
- FF 5-36
- FI 5-36
- FL 5-36
- FR 5-28
- FU 5-37
- help 5-39
- host 2-57
- IF 5-35
- ip 2-57
- IS 5-37
- KE 5-34
- LL 5-34
- LO 5-33
- ME 5-32
- model 2-57
- MS 5-30
- net 5-39
- PS 5-30
- quit 5-39
- RC 5-25
- RD 5-17
- RG 5-25
- RM 5-21
- RO 5-20
- RT 5-17
- SA 5-11
- SB 5-14
- SC 5-14
- SD 5-31
- SE 5-14
- serial 2-57
- SF 5-14
- SG 5-13
- SH 5-13
- SI 5-15
- SJ 5-15
- SK 5-15
- SL 5-13
- SO 5-11
- SP 5-12
- SQ 5-15

SR 5-10
ST 5-13
SU 5-15
SV 5-14
SW 5-12
SX 5-13
SY 5-32
SZ 5-12
TL 5-31
UD 5-29
WA 5-25
WB 5-26
WC 5-26
XA 5-18
XB 5-18
XC 5-25
XG 5-21
XI 5-18
XJ 5-18
XM 5-19
XO 5-21
XP 5-21
XQ 5-20
XR 5-19
XS 5-19
XT 5-19
XU 5-19
XV 5-18
YA 5-22
YE 5-33
YG 5-23
YK 5-22
YL 5-23
YM 5-23
YN 5-22
YQ 5-22
YS 5-23
YT 5-23
YU 5-24
YV 5-24
YW 5-25
YX 5-25
command (instrument information server) 2-57
command (Modbus master) 4-7
command name 5-1
command syntax 5-1
command-response 6-1
commands that can be used (barcode input) 3-15
commands that can be used (maintenance/test server 2-56
commands that can be used (setting/meas server) 2-23
communication condition 4-13
communication distance 3-1
communication timeout 1-3, 1-8, 2-16
conceptual diagram (BINARY) 6-2
configuring the Ethernet interface 2-3
confirming operation vii
confirming the connection status 1-8
connecting the Ethernet interface 2-2
connection status 1-8
connection to the server functions 1-1
connector pin arrangement (RS-232) 3-2
control command 5-5, 5-28
converter 3-8
CR + LF 5-2
CS-RS 3-4

D

data dropout (Modbus master) 4-14, App-9
data length 3-10
data length (BINARY output) 6-2
data reception control 3-3
data sum 6-3
data transmission control 3-3
default gateway 2-3
default password 2-21
delimiter 5-2
disconnecting the RS-422A/485 connection 3-14
DISP/ENTER key iv
DNS 2-3
DNS server 2-3
domain name 2-3
domain suffix 2-4

E

e-mail message 2-52
e-mail transmission 1-6
e-mail transmission function setting 2-42
e-mail transmission test 2-51
END flag 6-3
error Log 6-10
error message App-10
ESC key iv
escape code App-1
Ethernet interface connector v
execution mode 5-3, 5-4, 5-6

F

FIFO buffer App-2
file transfer destination directory 2-14
filter 7-3
first login 2-21
flag 6-3
flag (FIFO) 6-26
FLOAT_B 4-9
FLOAT_L 4-9
flow of operation vi
free messages 2-41
front panel iv
FTP 1-1
FTP client 1-4, 2-29
FTP client setting 2-10
FTP connection 2-10
FTP server 1-3, 2-26
FTP server name 2-10
FTP test 1-4, 2-29
FUNC key iv
functional structure (Ethernet interface) 1-1
functional structure (serial interface) 1-10

H

handshaking 3-3, 3-10
header sum 6-3
hold register 4-2
host name 2-3
HTTP 1-1

I

identifier (BINARY data) 6-3
indicator 2-9
initial path 2-10
input range parameter 5-8
input register 4-2
instrument information server 1-8, 2-57
INT16 4-8
INT32_B 4-8
INT32_L 4-8
IP 1-1
IP address 2-3
ITU-T 3-2

K

keepalive 1-3, 2-16

L

LF 5-2
line feed code App-1
list of commands 5-3
log 1-8, 1-13
log out 5-3
logging in (FTP server) 2-26
logging in (maintenance/test server) 2-54
logging in (setting/measurement server) 2-19
logging in after the first time 2-22
logging out (FTP server) 2-28
logging out (maintenance/test server) 2-56
logging out (setting/measurement server) 2-25
login (FTP server) 1-4
login (setting/measurement server) 1-3
login name 2-10
login process App-6

M

maintenance/test command 5-7, 5-38
maintenance/test server 1-8, 2-54
master 4-1
maximum number of connections 2-1
memory out 3-10
MENU key iv
messages during the login process App-7
Modbus error response 4-3
Modbus master 1-12
Modbus protocol specification 4-1
Modbus slave 1-12
MODBUS STATUS screen 4-13
monitor function (setting/measurement function) 1-11
monitor function (setting/measurement server) 1-2
monitor page 2-32
monitor page (contents) 2-37
multiple negative responses 6-1

N

name of part iv
negative response 6-1
number of bytes 6-25

O

OFF-OFF 3-3
operator page 2-32
output command 5-6, 5-35
output flow of FIFO data App-2
output flow of the file App-4
output flow of the file list App-5
output format (alarm summary) 6-17
output format (communication log) 6-8
output format (decimal position/unit information) 6-6
output format (e-mail log) 6-16
output format (FIFO BINARY data) 6-25
output format (file list) 6-21
output format (FTP log) 6-10
output format (measured/computed BINARY data) 6-25
output format (measured/computed data) 6-7
output format (message summary) 6-18
output format (operation log) 6-11
output format (output of a selected operation log) 6-14
output format (relay status) 6-22
output format (setting change log) 6-19
output format (SNTP log) 6-19
output format (status information) 6-20
output format (web operation log) 6-15
output format of ASCII data 6-6
output format of BINARY data 6-22, 6-23, 6-25
output format of instrument information 2-58
overview of the configuration 1-9

P

parameter 5-1
parameter (instrument information) 2-57
parity check 3-10, 4-4
password 2-10, 2-32
password (FTP server) 2-27
PASV mode 2-10
pin arrangement (RS-422A/485) 3-5
port number 2-1, 2-10, 2-42, 2-59
primary 2-3, 2-10
protocol (Modbus) 4-4
protocol (normal, barcode) 3-10

Q

query 5-2

R

read cycle 4-7
rear panel v
receive buffer 3-9
recipient 2-42
refreshing the monitor page 2-37
register assignments 4-2
response 5-2
response (instrument information) 2-58
response syntax 6-1
resuming command transmission 4-13
retrials 4-7
RS-232 interface connector v
RS-232 interface specification 3-1
RS-232 standard 3-2
RS-422A/485 dedicated command 5-6, 5-38
RS-422A/485 dedicated response 6-5
RS-422A/485 interface specification 3-1

RS-422A/485 interface terminal v

S

secondary 2-3, 2-10
sender 2-42
sender URL 2-43
serial interface converter 3-8
serial interface specification 3-1
server name 2-59
setting command (control) 5-18, 5-21
setting command (engineering mode) 5-3, 5-10
setting command (system mode) 5-4, 5-18
setting function (setting/measurement function) 1-11
setting function (setting/measurement server) 1-2
setting/measurement function 3-13
setting/measurement server 1-2, 2-19
signal direction 3-2
signal name (RS-232) 3-2
signal name (RS-422A/485) 3-5
single negative response 6-1
slave 4-1
SMTP 1-1
SMTP server 2-42
SNTP 1-1
SNTP client 1-7, 2-63
SNTP server 1-7, 2-63
SNTP synched to start 2-59
soft key iv
space code App-1
special data value 6-26
special message 6-9
starting/stopping e-mail transmissions 2-52
status display 2-9
status information 7-3
status report 7-1
storing operation viii
sub delimiter 5-2
subnet mask 2-3

T

TCP 1-1
terminator 3-1, 3-8, 5-2
time difference from GMT 2-32
time out 1-3, 1-8
timeout time 2-16, 4-7
transferring files (FTP client) 2-30
type (Modbud resister data) 4-8
type of ASCII data 6-2
type of BINARY data 6-2

U

UDP 1-1
UINT16 4-8
UINT32_B 4-9
UINT32_L 4-9
URL 2-36
use of part iv
user that is to use the communication input data 2-16
user information 6-22
user locked 2-20, 2-26
user name 2-32

W

Web server 2-36
web server 1-5
Web server setting 2-32

X

XON-RS 3-4
XON-XON 3-4